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PUBLIC HEALTH SERVICE
CENTERS FOR DISEASE CONTROL AND PREVENTION
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convenes

WORKING GROUP

ADVISORY BOARD ON
RADIATION AND WORKER HEALTH

PROCEDURES REVIEW

The verbatim transcript of the Working Group
Meeting of the Advisory Board on Radiation and
Worker Health held in Cincinnati, Ohio on Aug. 29,
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STEVEN RAY GREEN AND ASSOCIATES
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-- "*" denotes a spelling based on phonetics, without reference available.

-- (inaudible)/ (unintelligible) signifies speaker failure, usually failure to use a microphone.

P A R T I C I P A N T S

(By Group, in Alphabetical Order)

BOARD MEMBERS

CHAIR

ZIEMER, Paul L., Ph.D.
Professor Emeritus
School of Health Sciences
Purdue University
Lafayette, Indiana

EXECUTIVE SECRETARY

WADE, Lewis, Ph.D.
Senior Science Advisor
National Institute for Occupational Safety and Health
Centers for Disease Control and Prevention
Washington, DC

MEMBERSHIP

GIBSON, Michael H.
President
Paper, Allied-Industrial, Chemical, and Energy Union
Local 5-4200
Miamisburg, Ohio

GRIFFON, Mark A.
President
Creative Pollution Solutions, Inc.
Salem, New Hampshire

MUNN, Wanda I.
Senior Nuclear Engineer (Retired)
Richland, Washington

PRESLEY, Robert W.
Special Projects Engineer
BWXT Y12 National Security Complex
Clinton, Tennessee

IDENTIFIED PARTICIPANTS

ANIGSTEIN, BOB, SC&A
BEHLING, HANS, SC&A
BEHLING, KATHY, SC&A
BRACKETT, LIZ, ORAU
BURGOS, ZAIDA, NIOSH
CHEW, MEL, ORAU
ELLIOTT, LARRY, NIOSH
FIX, JACK, ORAU
GUIDO, JOE, ORAU
HINNEFELD, STUART, NIOSH
HOMOKI-TITUS, LIZ, HHS
HOWELL, EMILY, HHS
KATZ, TED, NIOSH
KOTSCH, JEFF, DOL
MAKHIJANI, ARJUN, SC&A
MARSCHKE, STEVE, SC&A
MAURO, JOHN, SC&A
MCGOWAN, BILL, UNIV. OF CINCINNATI
NETON, JIM, NIOSH
QUINN, TRISH
SHARFI, MUTTY, ORAU
SIEBERT, STEVE, ORAU
SMITH, MATTHEW, ORAU
THOMAS, ELYSE, ORAU

P R O C E E D I N G S

AUGUST 29, 2007

(9:30 a.m.)

OPENING REMARKS

DR. WADE: Good morning all. This is the work group conference room. This is Lew Wade, and the entire work group isn't here yet. Ms. Munn has decided to proceed so we're going to begin with my usual sort of monologue.

This is the work group on procedures review, and the work group is chaired by Ms. Munn, members Gibson, Griffon, Ziemer, Presley as an alternate. Right now in the room we have Wanda Munn and Paul Ziemer. We're awaiting Mike Gibson and Mark Griffon. We believe Robert Presley will be on the phone. Robert's an alternate.

Are there Board members on the phone right now?

MR. GRIFFON (by Telephone): Yeah, Lew, this is Mark Griffon. I'm on the phone. I'm sorry. I've been on for a few minutes. I just didn't hear any action.

DR. WADE: Thank you.

Is Mike Gibson on the phone?

1 (no response)

2 **DR. WADE:** Is Robert Presley on the phone?

3 (no response)

4 **DR. WADE:** Are there any other Board members
5 on the phone other than those named as part of
6 the work group?

7 (no response)

8 **DR. WADE:** Okay, so we don't have a quorum
9 of the Board, and it's acceptable to proceed.
10 So we have Munn, Ziemer in the room, Griffon
11 participating by telephone.

12 What we'll do is go around the table
13 here and let people identify themselves, then
14 we'll go through our normal run of people on
15 the telephone that will be NIOSH/ORAU team
16 members, SC&A team members, other feds who are
17 working today as part of this call, members of
18 Congress or their representatives, workers or
19 anyone else who wants to be identified on the
20 call. So let's start around the table here.

21 **MS. HOWELL:** Emily Howell, HHS.

22 **DR. MAKHIJANI:** Arjun Makhijani, SC&A.

23 **MS. MUNN:** Wanda Munn, Advisory Board and
24 Chair of this session.

25 **DR. ZIEMER:** Paul Ziemer, Advisory Board,

1 member of the work group.

2 **MR. HINNEFELD:** Stu Hinnefeld, NIOSH/OCAS.

3 **MS. THOMAS:** Elyse Thomas, O-R-A-U team.

4 **MR. SHARFI:** Mutty Sharfi, ORAU team.

5 **MR. CHEW:** Mel Chew, O-R-A-U team.

6 **MR. MARSCHKE:** Steve Marschke, SC&A.

7 **DR. MAURO:** John Mauro, SC&A.

8 **MR. MCGOWAN:** Bill McGowan, University of
9 Cincinnati, not a member of the committee but
10 an observer.

11 **DR. NETON:** Jim Neton, NIOSH.

12 **MS. BURGOS:** Zaida Burgos, NIOSH.

13 **DR. WADE:** Larry Elliott is around the table
14 but left the table just briefly.

15 This is Lew Wade, works on the
16 Advisory Board and works for NIOSH.

17 Let's go out to the telephone and hear
18 from other NIOSH or ORAU team members who are
19 on the line.

20 **MS. BRACKETT (by Telephone):** This is Liz
21 Brackett, O-R-A-U team.

22 **MR. SIEBERT (by Telephone):** Steve Siebert,
23 O-R-A-U.

24 **MR. FIX (by Telephone):** Jack Fix, ORAU
25 team.

1 **MR. GUIDO (by Telephone):** Joe Guido, ORAU
2 team.

3 **MR. SMITH (by Telephone):** Matthew Smith O-
4 R-A-U team.

5 **MR. KATZ (by Telephone):** Ted Katz, NIOSH.

6 **DR. WADE:** Other NIOSH or ORAU?

7 (no response)

8 **DR. WADE:** How about SC&A?

9 **DR. BEHLING (by Telephone):** Hans and Kathy
10 Behling.

11 **DR. ANIGSTEIN (by Telephone):** Bob
12 Anigstein, SC&A.

13 **DR. WADE:** Other SC&A team members?

14 (no response)

15 **DR. WADE:** Are there other federal employees
16 on the call by virtue of their employment?

17 **MS. HOMOKI-TITUS (by Telephone):** This is
18 Liz Homoki-Titus with HHS.

19 **DR. WADE:** Welcome.

20 **MR. KOTSCH (by Telephone):** Jeff Kotsch from
21 Labor.

22 **DR. WADE:** As always, Jeff, welcome.

23 Any other feds?

24 (no response)

25 **DR. WADE:** Members of Congress, their

1 representatives?

2 (no response)

3 **DR. WADE:** Are there any workers,
4 petitioners or their representatives on the
5 call?

6 **MS. QUINN (by Telephone):** Trish Quinn,
7 Center to Protect Workers' Rights.

8 **DR. WADE:** Thank you.

9 Anyone else on the call who wishes to
10 be identified for the record?

11 (no response)

12 **DR. WADE:** Okay, before we begin, again,
13 some simple rules of etiquette. Please, if
14 you're speaking, use a handset and not a
15 speaker phone. Mute whatever instrument
16 you're dealing with on the telephone when
17 you're not speaking. Be mindful of background
18 noises, and again, just think about your
19 situation and how it's broadcast to others and
20 it might affect the ability of the group to
21 function most efficiently.

22 With that, Wanda, it's all yours.

23 **MS. MUNN:** Thank you, Lew.

24 **ADDITIONS OR REVISIONS TO AGENDA**

25 I hope most of you have a copy of the

1 rough agenda that I hope to be able to follow
2 today. Anyone who's been on more than one of
3 these meetings knows that we have far more
4 than we can possibly get through in a single
5 day, but we're going to get through as much of
6 it as we can. And I have every intention of
7 touching each of the items that I've shown on
8 the agenda so we may have to cut some of our
9 deliberations short just so that we can get to
10 all of the items that are listed.

11 **REVIEW ACTION ITEMS FROM 6/26/07 TELECONFERENCE**

12 Let me go over my list of action items
13 from our last meeting which was a
14 teleconference held on June 26th. The action
15 items that I have listed are for SC&A to
16 verify the review of all procedures from the
17 first matrix which was originally issued as
18 final on July 23rd of 2006, and specify each
19 outstanding issue from that list.

20 To provide the protocol used in
21 workbook reviews and to create a matrix
22 supplement to crosswalk all TIBs and PROCs.

23 To provide a table showing what's been
24 reviewed and what has not.

25 To re-send the approach to PERs

1 information to work group members.

2 To re-issue a second working draft,
3 5/21/07 matrix including numerical level of
4 concern and indicating an asterisk for any
5 changes from earlier assessments.

6 SC&A and our designated federal
7 official were to discuss and resolve with the
8 contracting officer whether addenda to
9 existing SC&A reports are acceptable for
10 reporting reviews of revisions to procedures
11 resulting from earlier evaluations.

12 And, NIOSH was to report on whether
13 the global issues of ingestion internal dose
14 resuspension that were raised earlier have
15 been adequately addressed in subsequent
16 procedures and indicate where that was.

17 Are those action items in line with
18 memory and understanding of others around the
19 table?

20 (no audible response)

21 **MS. MUNN:** Good. Then with the hope that
22 one of the simpler, most easy to complete of
23 those items was the outcome of the discussions
24 with the contracting officer, I'd ask that
25 perhaps Lew could address that.

1 **REPORT ON OUTCOME OF DISCUSSIONS WITH CONTRACTING OFFICER**
2 **RE ADDENDA TO SC&A REPORTS**

3 **DR. WADE:** During my discussions with the
4 contracting officer, it's determined that,
5 yes, that addendum are an acceptable mechanism
6 for doing such reporting.

7 John, I don't know if you've pursued
8 that within your organization.

9 **DR. MAURO:** The addendum to the procedures
10 has been re-issued. It was released, and the
11 matrix reflects that. In other words the
12 Supplement One that was delivered, I believe,
13 about a year ago has, in fact, been modified.
14 Two or three of the reviews have been updated,
15 and I believe everyone should have hard copy
16 of that addendum along with a revised matrix
17 that, as you may recall, we wanted to add into
18 the matrix, the score.

19 Everyone should have a copy of that.
20 In fact, the latest version of it that Stu put
21 out on Friday or Monday also has at least some
22 of your responses. So I think we're pretty
23 current and have been keeping a track on the
24 addendum approach.

25 **MS. MUNN:** It looks like we're all right.

1 **DR. WADE:** We're better than all right.

2 **MS. MUNN:** We're better than all right. We
3 are ahead of schedule by ten minutes.

4 **SC&A COMMENTS ON REVIEW OF FIRST MATRIX, OUTSTANDING**

5 **ITEMS LIST**

6 We're ready for SC&A's comments on the review
7 of the first matrix and the outstanding items.
8 And let's all make sure we're working from the
9 same matrix when we start.

10 **DR. MAURO:** I think you're referring to this
11 crosswalk at this time from the first matrix
12 and the carryover.

13 **MS. MUNN:** Yes.

14 **DR. MAURO:** And there was a package that
15 Kathy Behling distributed for the crosswalk to
16 make sure that we're tracking closure. And I
17 believe Kathy is on the line, and she's in a
18 much better position than I can since she put
19 together the matrix dealing with the
20 crosswalk. And I believe that's what you're
21 referring to.

22 **MS. MUNN:** Well, actually, we can do that if
23 we want to. I have that scheduled for later
24 in the discussion, but we can do that first if
25 it's easier for you and for Kathy.

1 **DR. MAURO:** Well, I only bring that up
2 because I thought that's what you were
3 referring to. I may have cross-wired on you.

4 **MS. MUNN:** No, that's fine. I have that
5 listed after our break, but if you think that
6 will be a relatively easy one of our attacks
7 to get through then perhaps we should.

8 **DR. WADE:** For the record Mike Gibson has
9 joined us. Welcome, Mike. All of the work
10 group members are now participating.

11 **MS. MUNN:** Your call.

12 **DR. MAURO:** Well, apparently, you're
13 referring to something else, and I'm not quite
14 sure what that is.

15 **MS. MUNN:** I was talking about getting right
16 into the --

17 **DR. MAURO:** Oh, the big matrix.

18 **MS. MUNN:** Yes.

19 **DR. MAURO:** That's fine. We can do that
20 also.

21 **MS. MUNN:** I expected to do that so that we
22 could very quickly see what has been
23 accomplished by all the participants and take
24 a look at NIOSH's most recent distribution of
25 that.

1 **DR. MAURO:** That's bringing us to the big --

2 **MS. MUNN:** The big one.

3 **DR. MAURO:** -- with all the 33 procedures.

4 **MS. MUNN:** I thought we'd get some feel very
5 quickly for how far we have to go and what
6 we've completed here.

7 **DR. MAURO:** That being the case in terms of
8 the way I'm tracking it --

9 **MS. MUNN:** Hold on.

10 **MR. GRIFFON (by Telephone):** I'm sorry,
11 Wanda. This is Mark Griffon. Can you just
12 tell me which matrix you're referring to? I'm
13 --

14 **MS. MUNN:** We're talking about Supplement
15 One, Rev. One. We're talking about the
16 document that was just a re-sent with NIOSH
17 comments on it the day before yesterday.

18 **MR. GRIFFON (by Telephone):** Okay, thank
19 you.

20 **DR. MAURO:** I guess it's best for me to sort
21 of start this. I'm hoping everyone can hear.
22 Can everyone hear me on the line? I'm pretty
23 far from the microphone. I guess I'm okay.

24 As you're probably aware the way in
25 which we did this is we divided up, I think

1 there were about 33 procedures that we
2 reviewed, and we divided up amongst various
3 experts. And what I've done is to get things
4 started, the very first procedure that we
5 reviewed is a procedure OCAS TIB 0010 dealing
6 with the glove box.

7 Mainly, these were a procedure whereby
8 a person's working at a glove box, and he's
9 wearing his film badge or TLD on his lapel.
10 You're concerned about the exposure he may
11 have gotten to, let's say, the bladder.
12 There's an adjustment factor that's needed.
13 And that procedure deals with that subject.
14 And Bob Anigstein performed the review.

15 Now we could go one of two methods.
16 We could just summarize our findings regarding
17 that procedure, or I guess Stu, if you prefer,
18 since you folks are in the process of
19 reviewing our commentaries on each procedure.
20 So whichever way to go forward. Whether we
21 should take the lead or whether NIOSH should
22 take the lead. It's certainly your choice.

23 **MS. MUNN:** Well, there's yet a third one,
24 and that is the process that we discussed by
25 phone during our earlier meeting, whether we

1 wanted to concentrate on the items that were
2 already ranked as ones, twos, threes, et
3 cetera. So my personal preference would be to
4 spend first a few minutes concentrating on
5 those ones and twos to see where they were and
6 then after that proceed from the viewpoint of
7 whether NIOSH has specifics other than the
8 ones that they responded to.

9 I really would like to take a look at
10 the responses that NIOSH has made to see if
11 we're going to have a resolution to those at
12 this meeting or whether we're going to go
13 further. Does anyone have any problem with
14 addressing the ones and twos first just to see
15 where we are?

16 (no audible response)

17 **MS. MUNN:** If not, then I would prefer that
18 we run down the rating list, and when we
19 encounter a two have a quick response from
20 first SC&A and then NIOSH with regard to where
21 we are. And in that manner go through the
22 ones and twos and then address the items that
23 NIOSH has responded to just this week.

24 **MR. ELLIOTT:** Are you suggesting that, well,
25 let me propose this as a modification. There

1 are several TIBs or TBDs that have been
2 reviewed here, and the first one that John
3 just referred to, NIOSH has not provided a
4 response to yet. And so I don't know that
5 it'd do great service at this point to talk
6 about TIB-001 and a rating of one, two or so
7 until we come back with our reaction to that
8 criticism.

9 **MS. MUNN:** It's rated a three; and
10 therefore, from my perspective it's not the
11 place to start.

12 **MR. ELLIOTT:** I'm sorry.

13 **MR. HINNEFELD:** But on this document there
14 are twos. There are twos and we've not
15 prepared a response. We've not analyzed the
16 finding and prepared a response on this
17 document. So our preference, I think, would
18 be to go to the ones where we have provided a
19 response unless we, because, you know, I'm not
20 completely familiar with the report.

21 SC&A's attempt to describe pretty well
22 the finding in their report. The matrix
23 finding is for the summary or brief statement
24 of it. But their findings are generally
25 pretty well developed and pretty well

1 described in their report. And we just have
2 not gone through the exercise. We had ORAU
3 staff work on ORAU-prepared documents. We
4 just have our own staff available to work on
5 these, and so we haven't provided responses on
6 these.

7 **MR. ELLIOTT:** For completeness I would
8 suggest that we can say for TIB-0010 we
9 understand the comments that they've made, and
10 we are working on those. But we are not
11 prepared at this point to speak about where
12 we're at with regard to our reactions.

13 **MS. MUNN:** Because I want to make sure that
14 we cover two things. I want to make sure
15 we're covering the items that are marked one,
16 and the items that NIOSH has responded to.
17 Then if we want to eliminate, my suggestion
18 with respect to twos, I have no objection to
19 that. But I really would like for us to take
20 a look at all the ones to see what we actually
21 have out there. And then take a look at what
22 NIOSH has responded to if that's satisfactory.

23 (no audible response)

24 **MS. MUNN:** Nodding heads.

25 **DR. ZIEMER:** And just a quick question on

1 the matrix where it says NIOSH response. On
2 those documents which are O-R-A-U procedures,
3 those are actually responses from OCAS staff
4 rather than NIOSH staff but reviewed by NIOSH?

5 **MR. HINNEFELD:** They have been at this point
6 probably nominally reviewed. We just got
7 them, and we provided them to the Board rather
8 than spend the time reviewing it and not
9 having them available.

10 **DR. ZIEMER:** So where it says NIOSH response
11 --

12 **MR. HINNEFELD:** In large part that's ORAU.

13 **DR. ZIEMER:** In large part it's O-R-A-U team
14 response.

15 **MS. MUNN:** All right, so if we're looking at
16 the copy of Supplement One that was just e-
17 mailed to us this week, and we're looking at
18 the ratings only, then the first one that I
19 see is on page six of that --

20 **DR. ZIEMER:** Supplement One, Rev. One.

21 **MS. MUNN:** Supplement One, Rev. One. It
22 should have Monday's date on it, the 26th, I
23 believe. On page six, ranking one is ORAU
24 OTIB-0020.

25 **DR. MAURO:** That's correct. And I believe

1 that particular procedure was reviewed by Hans
2 Behling. I'm hoping --

3 Hans, are you on the line?

4 **DR. BEHLING (by Telephone):** Yes, I am.

5 **DR. MAURO:** I'll give you a second to sort
6 of catch up. I believe that was OTIB-0020,
7 and I have to flip through the report to get
8 the correct title, "The External Coworker
9 Model," and in your review at least one of the
10 elements of your review had a one in it, and I
11 guess I'm going to give you a sort of a chance
12 to catch up. Do you have the matrix or your
13 report in front of you?

14 **DR. BEHLING (by Telephone):** I have both the
15 matrix and the report. And I guess I just
16 want to make a comment here. Obviously,
17 everyone hopefully has had a chance to review
18 both the report itself as well as the matrix
19 which only gives you a snapshot of the issue.
20 But let me just point out that some of the
21 comments that are in that report really go to
22 a basic issue here that I found to be a
23 problem.

24 And that is it is an issue of
25 plausibility versus what might be considered

1 practical or achievable. And having been
2 involved in auditing dose reconstructions that
3 oftentimes involves a thorough review of what
4 the information is that is available to a dose
5 reconstructor out in the field, many of the
6 comments reflect that dichotomy between what
7 is theoretically possible versus what is
8 reasonable and what is available to the dose
9 reconstructor when he sits in his cubicle some
10 place and does this dose reconstruction. And
11 so keep in mind that this particular issue,
12 plausibility versus practicality.

13 Finding 4.1 is the one that I
14 identified as having a low value, and that is
15 due to the fact that, again, it's an issue of
16 what are the subjective elements to this? The
17 dose reconstructor has to make an awful lot of
18 decisions here that may or may not be
19 available to him. And I believe that many of
20 these decisions are likely to be very
21 subjective in nature. Again, you have to
22 really go through the report to come to that
23 conclusion.

24 That is, how do you know when a worker
25 has no records. Is it due to the fact that he

1 was monitored? Is it due to the
2 unavailability of records that may have been
3 lost? The difference between the 50th
4 percentile and 95th percentile value, these are
5 all things that you may or may not have
6 information. When you get a folder from the
7 DOE that says no records available for this
8 person, how do you know whether or not he is a
9 person who may have been only on occasion been
10 exposed to radiation that was monitored.

11 Was he a person who was routinely,
12 yes, I know that if you dig hard enough you
13 can probably come up with something that might
14 give you some clue as to whether a person was
15 routinely exposed and not monitored versus
16 only occasionally or never. But these are all
17 very, very subjective issues that somehow or
18 other the dose reconstructor has to come
19 conclude before he makes a decision whether to
20 assign the 50th percentile, the 95th
21 percentile.

22 And even there you have to know
23 whether or not this is likely to be
24 compensated, whether POC is equal to or
25 greater than 45 percent. So those are really

1 the bulk of the issues that define this
2 particular TIB-0020. And I believe they're
3 all basically identified and the responses
4 from NIOSH, obviously they're responses, but
5 again, I'm going to have to back away and say,
6 well, somebody else has to make the decision
7 whether or not this is reasonable.

8 And quite frankly, having -- and I've
9 sort of divorced myself at this point from the
10 auditing process of dose reconstruction. But
11 Kathy is very much involved at this point, and
12 I've conferred with Kathy on this issue. And
13 I said have you ever seen TIB-0020 being used,
14 and the answer is no. And so the question
15 again comes into play whether something that
16 can in theory be done versus one that is
17 practical and usable.

18 **MS. MUNN:** Hans, thank you for an overview.
19 May I hold us up for just a moment and point
20 out to everyone that although we were focusing
21 on the number one in the rating column, that
22 we actually have a half dozen almost OTIB-0020
23 issues here, and probably one of them should
24 not be discussed in segregation from the
25 others. So if we might have just a few

1 minutes to give everyone an opportunity to
2 review both the SC&A comments and the NIOSH
3 comments for all of the OTIB-0020 items
4 instead of just this single one it might be
5 beneficial to everyone.

6 **DR. MAURO:** I have a suggestion because in
7 going over the material and reading it one of
8 the things that I noticed is that every OTIB
9 has a certain objective and is trying to
10 accomplish something that's important to the
11 dose reconstruction process.

12 And I noticed that now we're jumping
13 right in, going into a number, OTIB-0020, and
14 then we're zeroing in into one element in it.
15 So it's very difficult to dive right into that
16 specific without sort of stepping back for a
17 second and say, okay, what is this OTIB about?
18 And what's it trying to accomplish?

19 And for example, if you look at the
20 big book, and you go to the checklist, you
21 quickly see, okay, there's a lot of scores
22 here. But one particular score came out with
23 a one. The point Hans is making there's a
24 specific aspect to this particular OTIB that
25 deals with a particular subject that is

1 troublesome to us, and we assigned it a one.

2 So I think maybe the best way to
3 communicate or get on the same page is maybe a
4 quick 30-second sound byte, what is this OTIB
5 about? What is it trying to accomplish? So
6 everybody's oriented. And then why is that a
7 concern, namely a judgment that is embedded in
8 this particular protocol?

9 There's a certain degree of judgment
10 that needs to be made by the DR that is
11 subjective. And our concern is that that
12 being the case you create a situation where
13 it's possible that different auditors or
14 different dose reconstructors may very well
15 come to a different judgment on a particular
16 matter, whether to use the 50 percentile
17 versus a 95th percentile so there are various
18 subjective judgments.

19 And I think what needs to be discussed
20 with NIOSH here is the degree to which that is
21 a real concern or whether or not it's well in
22 hand. So I think maybe this process we're
23 doing which we're inventing as we go, maybe
24 the best way to go is that when we hit a
25 procedure that has a one, real quickly get an

1 idea of what the procedure is about and why
2 that particular one might be important.

3 Maybe it would be helpful -- I don't
4 know if everyone else agrees -- if, Hans, if
5 you could sort of step back and just give a
6 quick overview of this particular procedure.
7 And then within that context why that one
8 might be an important issue that we need to
9 discuss.

10 And I guess, Stu, you folks have
11 responded to that and your sense, of course,
12 is that, well, perhaps it's not as serious a
13 problem as we may have made it out to be. I
14 think that will be a productive way to
15 proceed.

16 **MS. MUNN:** It would be a productive way to
17 proceed after we've done what I've just
18 suggested that we do which is let's take a
19 moment and everybody read all of the
20 commentary that we have on the matrix with
21 regard to OTIB-0020. That will take you back
22 to, given the most recent copy that we're
23 looking at, OTIB-0020 begins on page five.

24 **MR. GRIFFON (by Telephone):** Wanda? Can I
25 ask? I have the matrix, but I don't have the

1 NIOSH responses in the matrix so I think I
2 don't have the most recent version. Do you
3 know --

4 **MS. MUNN:** Do you have your e-mail up?

5 **MR. GRIFFON (by Telephone):** I do, yeah, do
6 you know when it was sent?

7 **MS. MUNN:** It was sent on the 26th. Sent
8 Monday morning very early.

9 **DR. WADE:** Now there's no NIOSH comments on
10 the first couple of pages so it might confuse
11 you. On the first page there's no NIOSH
12 comments, but as you get into it there are.

13 **MR. GRIFFON (by Telephone):** Sent on the 26th
14 from Stu?

15 **MR. HINNEFELD:** From me.

16 **MR. GRIFFON (by Telephone):** All I saw is
17 OTIB-0052.

18 **MS. MUNN:** No, that's a separate thing.

19 **DR. WADE:** Can you send it?

20 **MS. MUNN:** Arjun is telling me it's the 27th.

21 **MR. GRIFFON (by Telephone):** All I have on
22 the 27th from Stu is the initial responses to
23 OTIB-0052 findings.

24 **DR. MAKHIJANI:** I can send it to you if you
25 have your --

1 **MR. GRIFFON (by Telephone):** Yeah, if you
2 could forward it again, thank you.

3 **DR. ZIEMER:** Is there a separate report on
4 this one? There are on some of the TIBs.
5 What's the electronic reference for that one?

6 **DR. MAURO:** The actual hard copy report, the
7 original report -- let me step back. It might
8 be helpful. This is task three where our job
9 is to review procedures. And we were
10 reviewing procedures in groups of about 30.
11 The original set of 30 were reviewed, by and
12 large closed out, there may be some mop up.

13 Then the second set, and a report came
14 out. And that report actually came out in, I
15 believe it was dated on the order of June
16 2006. Now during the last meeting when we
17 were about to engage this particular set of
18 procedures, I volunteered to -- listen, it's
19 been a year since, you know, we wrote that
20 report, and we realized in getting ready for
21 that meeting that we've learned a lot. A lot
22 of things have changed; we've learned a lot.

23 And we also had a matrix. And the
24 matrix did not -- it's a big matrix, 37 pages,
25 and so one of the things I volunteered, I

1 said, listen, why don't we do two things.
2 Let's edit our June 2006 version of this
3 report and re-issue it with the revisions?
4 And it turns out two, three or four procedures
5 were revised, and we re-issued the report.

6 And it's actually dated now August
7 2007. The delivery date was August 17th, so
8 it's relatively recent. But by and large it's
9 very similar to the original one except for a
10 few procedures. In addition --

11 **MS. MUNN:** Did we get the page changes over
12 into the matrix?

13 **DR. MAURO:** And the matrix, yeah, captures,
14 it's up to date. And the matrix that came out
15 captures all of the changes that were there.
16 In addition, it adds in the score card.
17 Remember we wanted to put the score card in?

18 **MS. MUNN:** We agreed we would do that.

19 **DR. MAURO:** And we did that, and even more
20 was done. NIOSH had a chance at least to take
21 a run, at the 11th hour I would imagine, to try
22 to be responsive to as many that they could.
23 So that's where we are right now. So
24 hopefully, everyone has the matrix that's 37
25 pages, and everyone has the August 2007

1 version of this what's called Supplement One
2 Procedures. The second set of 30, it turns
3 out I think it's 33, procedure reviews. I'm
4 trying to sort of set the stage. It's
5 complicated.

6 **MS. MUNN:** Right.

7 **MS. BEHLING (by Telephone):** Excuse me, this
8 is Kathy Behling. In answer to Paul's
9 question also, the file name was called
10 Transmit Draft S-C-A-dash-P-R-dash-pass three-
11 dash-0-0-0-1-dash-rev-dash-1, and it was a PDF
12 file.

13 And, John, you are correct. When I
14 re-submitted the matrix, I did, the matrix
15 does reflect this Rev One and the page changes
16 on the Rev One. And I also included for those
17 changes that I made to ensure that there's a
18 vertical line on the left hand margin so that
19 you can see what has changed.

20 **DR. MAURO:** That's in the main body of the
21 big report. As you flip through the pages
22 you'll see a vertical line, and that's the
23 place where the changes are made.

24 **DR. MAKHIJANI:** If anybody doesn't have the
25 report, I have the e-mail in which it was

1 transmitted to me. I can send it to anyone
2 who wants it.

3 **MS. MUNN:** Stu, would you like to take a run
4 at what John has suggested with respect to
5 what OTIB-0020 is really all about and go
6 through the responses that we have here?

7 **MR. HINNEFELD:** OTIB-0020 is sort of a
8 guiding document more so for people preparing
9 later site-specific OTIBs that have actual
10 coworker data in them and is for a dose
11 reconstructor to pick up and use. And so it
12 pretty much describes this is how we will take
13 these datasets and build coworker
14 distributions. That's primarily what it's
15 used for.

16 The issue you raised though, the one
17 about 50 percent versus 95 percent is an issue
18 in the use of coworker in general. So if we
19 can address it here which would be a lot more
20 efficient than addressing it every time we
21 pick up a site-specific TIB. And I think --

22 Mutty, step in and say something if I
23 say something wrong here because Mutty does
24 dose reconstructions certainly far more than I
25 do.

1 But when choosing in this situation,
2 as a general, we know the sites, the DOE
3 sites, that give us what they have. When
4 you're talking about when a person doesn't
5 have monitoring data, it's because the DOE
6 didn't find it and send it to you or was it
7 lost or monitoring was lost. We don't know
8 that, people who were monitored and lost. We
9 know the sites, the DOE sites, that provide us
10 a full report. We pretty much know those, so
11 they gave us what they have, and so we go with
12 that.

13 Once we have that information though,
14 we typically don't just get the monitoring
15 information in a void. We got some
16 information either from the claimant himself
17 or from maybe it's in a DOE record. Some of
18 the records may include some things that gives
19 you an idea what their job was.

20 And so mainly we rely on job title to
21 make a judgment about is this person someone
22 who would have been a radiation worker because
23 quite likely there were a large number of
24 people who today we would probably consider,
25 well, they were a radiation worker or at least

1 a periodic radiation worker, and they should
2 have been monitored who were not monitored at
3 the time so you won't get any record for them.

4 So in most instances where the job
5 appears to be, any job where they could be
6 even periodically exposed, those people get
7 the higher percentile. In other words, if
8 they would be regularly exposed, they would
9 get the 95th percentile.

10 And it's only when we can decide with
11 some confidence that the person was really an
12 administrative worker who wouldn't be a
13 radiation worker in today's nomenclature, that
14 we would give them the 50th percentile which is
15 still, you know, that 50th percentile was the
16 monitored people. That's still a pretty
17 generous assignment for someone that we
18 conclude probably wasn't exposed.

19 So that's how we arrive at that
20 selection. I don't know that we've got
21 anything more formal written than that, but it
22 does have a dose reconstructor who makes the
23 judgment. The peer reviewer's judgment, a
24 peer reviewer from the dose reconstruction
25 organization can also say, you know, you

1 judged wrong. And then there's a Health
2 Physics review from the Health Physicist on
3 OCAS' side. So three different people have to
4 concur that that this person really, there's
5 sufficient evidence that this person wasn't
6 exposed in order to give them the lower
7 percent.

8 **DR. MAURO:** I think one of our concerns was
9 that when those judgments are made, and I
10 understand the ground rules that you just laid
11 out, when we have a DR that comes in 46
12 percent, that judgment becomes critical. And
13 it's at that place where I felt that if
14 there's any ambiguity, this is the place where
15 you could have a reversal if that judgment
16 wasn't bulletproof.

17 I guess that's where we came in; why a
18 one was important here. There are going to be
19 times when those judgments don't make a
20 difference, but there are going to be times
21 when they do make a difference. It wasn't
22 apparent to us whether or not there was
23 anything a little bit more structured in terms
24 of that judgment.

25 **MR. HINNEFELD:** Well, I think Matt Smith who

1 prepared the response on this, I believe
2 Matt's on the line.

3 Matt, do you have anything more you
4 wanted to offer?

5 **MR. SMITH (by Telephone):** Stu, you did a
6 good job summarizing the responses I wrote up.
7 Again, I would tell the group to keep
8 everything in context. When it comes to
9 prescriptive guidance, as Stu stated, that's
10 where site-specific OTIBs would come into
11 play.

12 Regarding the general 50th and 95th
13 percentile issue, there's a written response
14 on that as well. And if you folks want to
15 look at the final table in OTIB-0020, you'll
16 see there a comparison of some different data
17 analysis approaches, the one being the OTIB-
18 0020 method if you will. And the other one
19 being a maximum likelihood approach which I
20 know has been discussed before.

21 And I think you'll see that the OTIB-
22 0020 approach is quite favorable across the
23 board. As Stu mentioned, even the 50th
24 percentile values are giving us a good cushion
25 of claimant favorability.

1 Other than that, again, the dose
2 reconstructors are not working in a vacuum in
3 a cubicle. They have not only other documents
4 to look at. They have what we term site DR
5 leads. For instance, Muttly is the DR lead for
6 Rocky Flats. So they have a, if you will, a
7 senior dose reconstructor to refer to and to
8 bounce questions off of regarding how the data
9 looks.

10 And then beyond that there's also, as
11 Stu mentioned, a peer review process. And
12 unless there's further question, I think I'll
13 leave it at that.

14 **DR. BEHLING (by Telephone):** This is Hans
15 Behling. I just wanted to again go back and
16 address the issue of the subjective nature,
17 and I think I'm really focusing on earlier
18 years when, especially early years when cohort
19 badging was a matter of fact in the way of
20 monitoring workers where people who should
21 have been monitored were not monitored, and
22 they may have been decided on because they're
23 (unintelligible) exposed group, but clearly
24 were exposed.

25 And subjective interpretation on the

1 part of the dose reconstructor to decide what
2 portion or what periods of time does the
3 worker qualify for the statement that he
4 should have been monitored but was not
5 monitored or by today's standards he needed to
6 be monitored, et cetera, et cetera.

7 That's really the issue that I want to
8 bring out here on this particular TIB is that
9 we're not dealing with a single issue here but
10 a variable issue that changes over time
11 because of various practices that were in
12 vogue in the early years in the '40s, '50s and
13 '60s that were subsequently much more
14 restrictive later on when people were, as a
15 whole, regarded as all potential exposures,
16 and therefore, the issue that we have to
17 address here is not a single issue but one
18 that changes over time.

19 **DR. NETON:** Hans, this is Jim Neton. I just
20 got a question. I understand your concern
21 about the potential misapplication of 50th
22 versus the 95th with the dose reconstructors.
23 But I think as Stu pointed out we tend to be
24 extremely conservative in our approach to
25 selecting those values, and there's multiple

1 checks along the way.

2 I guess my question is of all the dose
3 reconstructions SC&A has done has there been
4 any evidence to indicate that we have
5 improperly or possibly improperly assigned 50th
6 versus 95th? Because in my mind the proof is
7 in the practice.

8 **DR. BEHLING (by Telephone):** Well, as I
9 started out by saying to date I don't think
10 we've ever seen a dose reconstruction report
11 that even makes use of OTIB-0020.

12 **DR. NETON:** As selecting the 50th versus the
13 95th? No.

14 **MR. SHARFI:** One of the main differences we
15 don't reference specifically OTIB-0020 since
16 we reference the site-specific --

17 **DR. NETON:** Exactly, so we --

18 **MR. SHARFI:** -- coworkers.

19 **DR. NETON:** -- we have clearly used the 50th
20 versus the 95th in multiple cases. And that
21 was the issue we were discussing here.

22 **MR. HINNEFELD:** But in terms of the ones
23 they've reviewed, I don't know. A lot of the
24 ones they reviewed were dose model, you know,
25 dose model. So it may be that there has not

1 been a coworker that's been selected --

2 **DR. NETON:** I think that might be a good
3 thing to do because, again, the proof is in
4 the facts here. I think we certainly believe
5 we've got a conservative approach, and I don't
6 know any way around that. I don't know what
7 the solution would be other than to look at
8 some of these things and see. Have we not
9 appropriately assigned a dose?

10 **MR. SHARFI:** I would add on OTIB-0020, it's
11 a general coworker application TIB. When
12 you're doing DR, you do need site-specific
13 information to make decisions and to put a
14 general blanket, across-the-board, complex
15 decision process into a TIB that's not site
16 specific almost hinders you from using
17 claimant and site-specific information. So
18 areas like that might be more suited to the
19 site-specific coworkers if there's knowledge
20 that they've done batch monitoring or stuff
21 like that. Or if you know specifically that
22 they badged everybody, that stuff can be very
23 more site specific rather than putting them
24 into a complex-wide TIB when this TIB just
25 covers how to develop and the general use of

1 coworker. It's not really designed for site-
2 specific application.

3 **DR. MAURO:** Am I hearing that for all
4 intents and purposes this TIB is general
5 guidance, but in practice it really doesn't
6 come to the surface? That is, what I'm
7 hearing is the reality is every case is being
8 dealt with on the merits of that particular
9 site and its dataset as opposed to drawing
10 upon some overarching universal guide such as
11 this one. So perhaps --

12 **MR. SHARFI:** For instance like you have the
13 Rocky Flats external coworker would have
14 referenced OTIB-0020 in development of that
15 coworker set, but the DR would not have
16 referenced OTIB-0020. They would have
17 referenced the site-specific coworker. So
18 it's maybe one removed from the original DR.

19 **DR. MAURO:** To ask an embarrassing question
20 perhaps this is a procedure that really is
21 really not all that relevant?

22 **MR. SMITH (by Telephone):** Well, it is a
23 relevant procedure because it serves as the
24 keystone for the follow-on series of external
25 coworker TIBs that have been developed. And

1 everyone in the room there stated the correct
2 thing, and that language is located in Section
3 One, The Purpose, where it does talk about
4 using OTIB-0020 in conjunction with separate
5 TIBs that provides a site-specific coworker.
6 So it is a keystone document.

7 **DR. MAURO:** Okay, so I just want to make
8 sure I understand. So in effect this is the
9 keystone that sets the philosophy and then the
10 philosophy is implemented on a case-by-case
11 basis according to that philosophy.

12 **MR. SMITH (by Telephone):** That's right.

13 **DR. MAURO:** And the degree to which the way
14 in which it's implemented is consistent,
15 really emerges on the actual application for a
16 particular site. So that's really where the -
17 - in effect, the concern that we have would
18 become realized. I guess maybe another way in
19 what we're saying is that it is the right
20 question.

21 Have we come across cases where we
22 felt that the 50th percentile was used when we
23 think that perhaps the 95th percentile should
24 have been used. I don't know if that's
25 something you want to talk about here related

1 to this particular procedure or is that better
2 suited to be discussed as part of the DR
3 review when we get into our Task Four review
4 process? I think that's where it belongs as
5 opposed to this underpinning issue.

6 **MR. HINNEFELD:** Yeah, the forum for
7 discussion can be either one I suppose. I
8 think in order to have a discussion though
9 we'll have to do some preparation and, you
10 know, look through, we should be able to
11 identify of the ones that have been reviewed,
12 did any of them reference a site-specific
13 coworker TIB. In which case that would be an
14 instance where this approach would have been
15 used. So I mean, we could do something like
16 that in preparation for that discussion when
17 we're doing (unintelligible). I don't really
18 know that we have an opinion on what to do
19 there.

20 **DR. BEHLING (by Telephone):** Stu, this is
21 Hans. Maybe you can respond to this specific
22 issue or question I have. What is the trigger
23 that would say we should look at OTIB-0020 as
24 a way of reconstructing this person's dose?
25 Let me start out by saying you get a file on a

1 person who has a claim, and the DOE file says
2 there are no data for this person either in
3 bioassay or external monitoring.

4 And the first reaction would be, well,
5 this person was not a rad worker, and let's
6 just for the sake of claimant favorability
7 assign him the maximum dose based on the TIB-
8 0004 which involves occupational environmental
9 exposure and be done with it. We've seen
10 plenty of those. Now what is the trigger by
11 which this particular TIB would be used in
12 lieu of, say, assigning strictly environmental
13 dose and be done?

14 **MR. HINNEFELD:** Well, the trigger would
15 trigger the use of a site-specific coworker
16 TIB. It wouldn't trigger the use of OTIB-
17 0020. It would trigger the use of a site-
18 specific coworker TIB that was prepared on the
19 guidance in OTIB-0020. So the trigger would
20 be the information available about the
21 employee's, essentially, their job title.
22 That is the most important thing that would be
23 looked at is their job title, and do we have
24 sufficient information about their job title
25 and perhaps their location of work.

1 Although job titles are normally a
2 little more reliable than work location.
3 People tend to move around. Is that
4 information sufficient for us to conclude that
5 this person wouldn't be considered a
6 radiological worker today, was not really
7 exposed, and so the environmental would be the
8 right approach. So that's the trigger. It's
9 largely, the most important thing is job
10 title.

11 **DR. BEHLING (by Telephone):** How about in
12 the absence of a coworker model? And again,
13 there are provisions in this TIB that says,
14 well, if you don't have a coworker model to
15 work with, you may also elect to have or to
16 apply what are called or what are stated as
17 reasonable upper limits. And again, this is a
18 very, very subjective term, the reasonable
19 upper limits for someone where there's no
20 coworker data to work with. Again, it sounds
21 nice, but I would sort of look at this and say
22 that's a very heavy request to be put on a
23 dose reconstructor for defining what is a
24 reasonable upper exposure for an unmonitored
25 individual.

1 **MR. HINNEFELD:** Well, that would have to be
2 case specific, and I don't know that we
3 actually do that very much. I know we very
4 often have had cases we put on hold to develop
5 a site-specific site profile, or site-specific
6 coworker dataset.

7 **DR. NETON:** So I think, Hans, that guidance
8 would be fleshed out in the site-specific TIB.
9 Again, remember this is a general guidance
10 document on how one approaches using, filling
11 in gaps in data. And what comes to mind to me
12 is the Chapman Valve site profile where we had
13 a real sparse amount of data, and we took the
14 highest value ever measured in the urine and
15 used that to reconstruct these workers' doses.
16 But that was not a decision that would be made
17 by a dose reconstructor. That was fleshed out
18 in the site-specific profile. So OTIB-0020
19 doesn't try to lock you in to a generic
20 approach. It provides reasonable guidelines,
21 but then it says there are other alternative
22 mechanisms that one may use.

23 **DR. ZIEMER:** It sounds like this particular
24 TIB, the question you end up asking is the
25 guidance appropriate? Because the actual

1 application comes out in each specific site or
2 case. The guidance, I think, Hans, you're
3 asking a question, the details on how to apply
4 it aren't given because you don't have that
5 unless you know what site it is that you're
6 talking about. So it seems to me you still
7 end up stepping back and saying is this
8 appropriate guidance.

9 **DR. BEHLING (by Telephone):** What I'm always
10 afraid of when I see too much subjective
11 interpretation is consistency. The way I
12 would like to test that is to give a single
13 case to ten different dose reconstructors and
14 see how ten people interpret the guidance
15 given here in their own way and see what is
16 the level of consistency among those people
17 who are independently trying to go through
18 this maze of potential options for them to
19 think in doing a dose reconstruction.

20 **DR. ZIEMER:** What I'm hearing is those ten
21 people wouldn't be sent to this document.
22 They would be sent to a secondary document.
23 And the question is, is the secondary document
24 appropriate based on this guidance, I guess it
25 seems to me would be the question unless I'm

1 misunderstanding its use.

2 **MR. SMITH (by Telephone):** In addition to
3 that, Dr. Ziemer, the dose reconstructor is
4 always going to use what's in procedure six
5 which is the external dosimetry procedure.
6 And in there is a table called Table 5.2 which
7 is a replication of Table 1.1 in OCAS' 0-0-1.
8 And that contains the hierarchy of data that a
9 dose reconstructor would use. Coworker data
10 is one of those choices.

11 And it's absolutely correct. If
12 coworker data proves to be the desirable
13 choice, you're going to go to a specific
14 document. If that document's not available,
15 then as Dr. Neton said, other data that you
16 might find in the site profile as well as
17 documents that continue to come in and get
18 catalogued in our site research database might
19 be referenced.

20 **DR. MAKHIJANI:** I guess part of the
21 puzzlement as I look at this is maybe in the
22 four bullets that are in the procedure. Just
23 thinking back on our experience of
24 specifically looking at Y-12 and Rocky Flats
25 external dose questions, the procedure

1 specifies four different kinds of unmonitored
2 workers who wouldn't be monitored by today's
3 standards, unmonitored but would be monitored
4 today, worker may have been monitored but data
5 not available, and may have partial
6 information. Partial information I think is
7 reasonably clear.

8 But in the other three categories I
9 think that's where the judgment call comes in,
10 and if I remember, many of our arguments
11 around or discussions around Y-12 and Rocky
12 Flats revolved exactly around the question of
13 how do you know which bin that they fall into
14 when there's a lot of uncertainty. And maybe
15 that's sort of where the procedure doesn't
16 seem specific enough in narrowing down how you
17 make that choice. At least just from somebody
18 who didn't participate in writing the review,
19 it seems to me that that may be a large part
20 of the problem.

21 **DR. MAURO:** And especially in the earlier
22 years.

23 **DR. MAKHIJANI:** Yes, I should qualify that
24 by saying that it would be especially in the
25 '50s or '40s and '50s.

1 **MR. HINNEFELD:** and I think the place to
2 look at that question would be on the site-
3 specific coworker TIBs that were prepared and
4 see what information was available for that
5 site and is it appropriate guidance for people
6 who are going to use this site-specific OTIB
7 which is what would be used in dose
8 reconstruction. Is that sufficient? I think
9 I'm a little, I don't know how you'd do it in
10 a procedure that's generally broadly
11 applicable.

12 **DR. MAKHIJANI:** Well, Stu, in reviewing
13 other procedures that kind of have similar
14 issues, I felt that providing an example in a
15 procedure that's very general, or set of
16 examples, is very helpful because it shows you
17 the kinds of things you're talking about
18 without necessarily narrowing it down and
19 being prescriptive.

20 **DR. NETON:** The problem with that is it
21 tends to pigeon-hole the whole process because
22 there's a wide range of ways we deal with
23 this. I can think of the one extreme which is
24 everyone gets the 95th percentile, Bethlehem
25 Steel and those where we couldn't even find a

1 job title to determine who walked through
2 those areas.

3 And then on the other extreme, people
4 who were administrative office workers at
5 Hanford that never even entered the fence
6 line. They worked in the town, and then
7 that's another extreme where we can say, well,
8 we looked. Clearly, environmental seemed
9 appropriate.

10 Then you get into people that were not
11 monitored at all, could have had some
12 exposure, and then we'll pick the 50th, but
13 there's a whole range there, and that's what
14 it's trying to accomplish, to accommodate all
15 those different scenarios. I don't know that
16 you can --

17 **DR. MAKHIJANI:** Wouldn't those two examples
18 of those two extremes be useful in this
19 procedure so it's not --

20 **DR. NETON:** In fact, that's what Stu was
21 saying. Those are part of the site profiles.
22 The site profiles actually do that, but it
23 could go in there. Whenever you put examples
24 that tends to lock people into certain
25 scenarios, and then it's what about this then,

1 and what about that, and those are all
2 discussed at document preparation time in the
3 site profiles. And those documents go through
4 multiple layers of review as well.

5 **DR. ZIEMER:** I've determined in hopes that
6 this doesn't become the working group on --
7 what is this procedure? Twenty. OTIB-0020,
8 it seems to me that we kind of have a feel for
9 what this procedure is. As I looked at the
10 reviews, there's a lots of threes there. In
11 fact, I think all threes of them is this
12 particular one.

13 And I don't know if we know the
14 importance of the one at the moment, but we
15 kind of have a context for it. And I'm
16 wondering if it wouldn't be useful to proceed
17 and sort of set this aside for the moment. I
18 don't think we can resolve it necessarily.
19 The one at the moment represents a kind of
20 concern to make sure that the procedure or the
21 OTIB is properly used. And I think we've
22 heard that proper use of that plays out in
23 other OTIBs as I understand it.

24 So I'm wondering if it is inefficient
25 to focus too much more time on this at the

1 moment until we get the overall picture which
2 I know you wanted to go through maybe a number
3 of these and see where the ones are. And this
4 is one of the ones. But it doesn't look to me
5 like it's necessarily going to be resolved
6 sort of momentarily.

7 **MS. MUNN:** Unfortunately, it doesn't.

8 **DR. ZIEMER:** Unless we have the bigger
9 context of the use here --

10 **MS. MUNN:** I do want to get --

11 **DR. ZIEMER:** I think we have kind of a feel
12 for the context of this particular one,
13 numerical one, and I'm wondering if it would
14 be helpful to look at the other ones that you
15 had in mind.

16 **MS. MUNN:** I think it would, but before we
17 leave this, I think the discussion has brought
18 to the forefront the key issue as it appears
19 to have evolved here. That key issue being
20 shall we use general guideline procedures or
21 must general guideline procedures contain the
22 amount of specificity that creates rigid
23 application of the procedure.

24 My personal feeling is that general
25 guidelines are very helpful. They are a

1 baseline from which other applications can be
2 derived. It's a pointer to show the way and
3 method for defining limitations. It appears
4 to me the procedure as I recall it, not having
5 read it in several months, comes close to
6 that.

7 But if that's the key question, we
8 need to define it. If it's not, then we need
9 to define what is the key question here.

10 **DR. ZIEMER:** Well, I think I agree with what
11 you're saying and that guidelines, per se,
12 don't necessarily need that specificity. Let
13 me mention sort of the classic cases where a
14 regulation says that doses are to be as low as
15 reasonably achievable. What does that mean?
16 It means something different in every
17 situation, and you can't spell it out except
18 philosophically at the front end. And it may
19 be that the philosophical statement here is
20 not, well, it probably isn't clear at the
21 front end that that's really what it is. But
22 it may be that the procedure itself needs
23 some, I don't recall. We'd have to go back
24 and look at the front end an explanation of
25 what this is, that this is a general guidance

1 or something. Maybe it already says that. I
2 don't recall.

3 **MR. HINNEFELD:** I'd have to look.

4 **MS. MUNN:** Hans --

5 **DR. ZIEMER:** But anyway, it may need some
6 fixing based on this, but and maybe even that
7 particular case that got the one may need some
8 clarification that says that this is sort of a
9 philosophical statement and it's played out in
10 specific cases.

11 **MS. MUNN:** Hans and John, would you be
12 comfortable with our taking another look at
13 the procedure to see if it's clearly defined
14 in the manner we've described here? And if
15 not, the addition of some words making clear
16 that this is as it's been characterized, a
17 keystone not the actual procedure for
18 directing how to proceed? Is that acceptable
19 to you?

20 **DR. MAURO:** I'll offer one thought on it
21 seems to me that the significance really comes
22 to life in the application on real cases at
23 real sites. If we find that, holy mackerel,
24 gee, we have a whole bunch of real people at
25 real sites where judgments were made that we

1 don't entirely agree with. That is, you may
2 have used the 95th percentile or 50th
3 percentile where in our opinion, in our
4 review, audit of the case, it should have been
5 the 95th percentile.

6 And by the way, that might be
7 important because in this particular case it
8 creates a situation where there's the
9 possibility for reversal, and especially if we
10 have a number of those and they merge. Then
11 we have to ask ourselves the question if we
12 all agree, yes, that's a problem and that
13 needs to be fixed in these real cases. And
14 we'll discuss it.

15 Then the deeper question goes, well,
16 is the problem because of this procedure
17 because this procedure did not give the dose
18 reconstructor the directions that could have
19 helped him be a little bit more rigorous in
20 making these judgments. Or is the procedure
21 fine.

22 It's really that, I'm not sure. In
23 other words if there is a breakdown some place
24 where judgments are being made and no optimum
25 judgments in terms of being claimant

1 favorable, and we actually find out that's a
2 real issue that we need to deal with, we won't
3 know that until we engage real cases and real
4 sites. Like Chapman Valve is a perfect
5 example.

6 I think Jim is right. Here's a case
7 where the philosophy that was intended
8 embedded in this was carried and in what we
9 considered to be a perfectly appropriate
10 approach. In other words we picked the
11 highest value. So the judgment in
12 implementing that procedure at Chapman Valve,
13 what happened was, great, you picked the
14 highest number. You really couldn't have been
15 more conservative.

16 But there may be other places where
17 the judgment was made in a way that we may not
18 agree. And then we have to ask ourselves the
19 question -- I don't know the answer to this --
20 if we agree there was a problem on a real
21 case, is the problem because of this
22 procedure? And is there anything we can do in
23 this procedure that would help avoid that
24 problem in the future? So we really can't do
25 much more than that right now.

1 **DR. BEHLING (by Telephone):** Let me also add
2 something, and I agree with everything you
3 said, John. Let me make a broad statement. I
4 think with the procedure if it is implemented
5 in the proper way is as good as it's going to
6 get. I fully realize that there are certain
7 deficiencies in past monitoring practice, and
8 certain assumptions have to be applied in
9 those instances.

10 And my concern only here in writing up
11 some of these issues is that will there be
12 always a reasonable and claimant-favorable
13 approach taken when you end up with a claim
14 for which there is no monitoring data and the
15 potential exists as in bullet number one. The
16 worker was unmonitored and even by today's
17 standards did not need to be monitored. Well,
18 if one could firmly understand that to be a
19 fact, then it's clear what the decision is.
20 Don't bother, just assign environmental
21 exposure and be done with it.

22 On the other hand, for instance, when
23 I looked at the Paducah Gaseous Diffusion
24 Plant, I realized that early on there was
25 cohort badging. And there were probably many

1 people who subsequently in 1960 starting on
2 were monitored. And lo and behold, the doses
3 there were actually higher in some instances
4 for people who were previously unmonitored.
5 Therefore, the assumption that we only started
6 to monitoring mostly people who were maximally
7 exposed may or may not have been the truth
8 there, and therefore, you may have in previous
9 years, prior to '60, not bothered to badge
10 people who should have been badged.

11 But if, let's assume that they
12 terminated their employment prior to that
13 moment in time and you left with nothing other
14 than a blank slate that says this person was
15 no monitored, and he may have been labor, what
16 do you do in those instances in trying to give
17 a conservative default value to that person's
18 dose reconstruction?

19 **DR. WADE:** Could I suggest maybe a path
20 forward. I mean, I think there are possibly
21 two actions that result from this. The one I
22 think is that NIOSH should review the tape and
23 make sure that it's clear in defining what it
24 is and what's its intentions are. It's a
25 general guidance document that points you to

1 some specific TIBs. And if that's the case,
2 fine. If it needs to be crisp up the wording
3 I think that's fine. I think that's
4 appropriate for the subcommittee that reviews
5 dose reconstruction at SC&A to keep an eye on
6 these issues as they review dose
7 reconstructions. And should they find
8 evidence of the fact that there are questions
9 or problems, then they should be raised to
10 subcommittee and dealt with at that level.

11 **MR. SMITH (by Telephone):** I guess on that
12 issue of that first action I would point the
13 group to the final sentence of Section One
14 which is the purpose section of this TIB.
15 It's also repeated in the comment response.

16 **MS. MUNN:** Can you speak just a little
17 louder and --

18 **DR. WADE:** And can you tell us what that
19 sentence --

20 **MR. SMITH (by Telephone):** The final
21 sentence on the purpose section states, "This
22 TIB is to be used in conjunction with separate
23 TIBS or other approved documents that provide
24 site-specific coworker data."

25 **DR. ZIEMER:** Which is what we

1 (unintelligible).

2 **MR. SMITH (by Telephone):** That may take
3 care of action number one.

4 **MS. MUNN:** That's the statement I wanted to
5 hear. I don't know whether that's the
6 statement that SC&A wanted to hear.

7 **DR. WADE:** So now we're left with action
8 two.

9 **MS. BEHLING (by Telephone):** This is Kathy
10 Behling, and with regard to, I've looked at
11 almost 150 dose reconstructions at this point
12 in time, and we carefully look at all of the
13 information that is being used whether it's
14 coworker data. We review all of the
15 procedures and all of the source documents,
16 most of the source documents that are being
17 used in order to determine if we agree with
18 the assumptions used by NIOSH. So we are
19 definitely looking at any assumptions whether
20 they're 50th percentile assumptions or 95th
21 percentile assumptions with regard to coworker
22 data.

23 **DR. MAURO:** Kathy, this is John. In light
24 of that is it your sense that places, I
25 presume that as I recall there are times when

1 we disagree with the percentile that may have
2 been adopted in a particular dose
3 reconstruction. And in your sense is there
4 anything that could be done to 0020 that might
5 have provided the guidelines that could have
6 made it a little bit more non-subjective? Or
7 do you think that that's not the problem.

8 In other words when we see that we may
9 have some disagreement on which percentile was
10 used, do you think the problem lies in this
11 OTIB-0020 or is it really something that a
12 judgment, 0020 did everything it could do.
13 The problem really becomes how it was
14 implemented on a particular case.

15 **MS. BEHLING (by Telephone):** I guess I have
16 a little bit of difficulty in answering that
17 because as Hans indicated, I have never seen
18 in the cases that I've looked at where they
19 specifically cited OTIB-0020 for the basis for
20 the coworker data.

21 I have seen cases where they use site-
22 specific coworker data and in those cases up
23 to this point in time, we haven't seen a lot,
24 but so far everything that I've looked at
25 seemed to be reasonable and claimant

1 favorable. And so I can't really state that I
2 can go back to this OTIB-0020 and indicated
3 that there has been a problem.

4 **DR. WADE:** So maybe we have no action items.

5 **MS. MUNN:** We have no answer?

6 **DR. WADE:** No action items.

7 **MS. MUNN:** Oh, thank you. I am interpreting
8 that as agreement that the final sentence we
9 just heard covers the crux of the problem that
10 SC&A has with this issue.

11 **DR. MAURO:** What I just heard is that where
12 the rubber meets the road on the real cases we
13 have generally found that the correct
14 judgments were made in terms of what
15 percentile to operate at. And that being the
16 case I'd have to say that, in effect, it means
17 that it validates OTIB-0020. Notwithstanding
18 the fact that there may be some interpretation
19 in ambiguity here that could be improved, but
20 nevertheless at least in the cases that we've
21 looked at, the judgments that were made in the
22 real cases seem to be -- and, Kathy, correct
23 me if I'm wrong -- by and large the correct
24 judgments.

25 **MS. MUNN:** Made on the basis of other OTIBs

1 --

2 **DR. MAURO:** Other OTIBs which, of course,
3 ultimately were based on this philosophy.

4 **MS. MUNN:** Correct.

5 **MS. BEHLING (by Telephone):** What I would
6 say is we have not seen a great deal of cases
7 that have used the coworker models. I think
8 it's just the more recent cases that are
9 starting to use more of the coworker model
10 data. What I've seen so far seems to be
11 reasonable. If there's going to be maybe an
12 action item, I would possibly recommend that
13 during the selection of cases that we review
14 maybe this becomes a selection criteria was
15 coworker data used. And we can look at this
16 issue more closely or at least see more cases
17 that uses coworker model data.

18 **MR. GRIFFON (by Telephone):** This is Mark
19 Griffon. I have one question, Wanda. When
20 I'm looking at this, I mean, when I look at
21 the title of this TIB, it looks to be a fairly
22 important document. When I look at the meat
23 of it, I'm not sure it rises to that level.

24 But my question is I agree with what
25 was said with regard application to the

1 individual dose reconstruction level, but I'm
2 curious whether this TIB is used by the site
3 profile authors because it seems to really
4 apply to the people that are developing the
5 coworker models up front for the site-specific
6 coworker model.

7 If you look in Section 6 of the TIB,
8 there's a sentence there which I, you know,
9 I'm very curious about which says that, it's
10 like the third sentence there that says, "A
11 sampling of the data are compared to claim-
12 specific data submitted to NIOSH by the DOE
13 sites," to basically to assess whether the
14 electronic data is usable as a coworker model.

15 So when I look at this title I'm
16 thinking, okay, this is the criteria by which
17 NIOSH determines whether the data is
18 sufficient and under what circumstances a
19 coworker model can be developed from the data
20 they have for a particular site. And then
21 under what circumstances they'll say it's
22 inadequate or that kind of judgment will be
23 made.

24 But I don't see many of those sort of
25 triggers in there that tell me, okay, what are

1 your ground rules. What, you know, is there a
2 certain statistical analysis that you want to
3 do that says if we have, if the data looks
4 like this, we're just going to determine that
5 it's inadequate.

6 There might be gray areas, but at a
7 certain point we would make a sort of
8 overarching, policy-level criteria that at
9 least the data have to, have to meet these
10 certain criteria to be usable as coworker data
11 or something like that. Or that you have to
12 have a certain amount of information on the
13 employees. You know, do you have sufficient
14 job information or information about where the
15 people would have worked to determine whether
16 a coworker model could be applicable for that
17 site.

18 And I don't see any of that really in
19 this TIB to tell you the truth. But I guess
20 my one question that I would ask NIOSH is do
21 the site profile authors abide by this TIB?
22 Are they using this TIB in any way to guide
23 them when they develop the coworker models up
24 front?

25 **MR. SHARFI:** Look at the site-specific

1 coworkers TIBs. I believe in almost every
2 case the first reference will this TIB.

3 **MR. GRIFFON (by Telephone):** Okay, okay, so
4 they do, and they would abide by that phrase I
5 just read which is to check these data against
6 claim data. Because, I mean, in a few of our
7 SEC reviews I wonder if that has happened.

8 **MR. SMITH (by Telephone):** And, Mark, even
9 on Rocky Flats when we were going over OTIB-
10 0058, this was a specific area that was looked
11 at even in the earliest provisions of that
12 TIB, and further work was done on this
13 specific issue. And there's one area that is
14 always addressed in a separate type-specific
15 coworker TIB. You know, Hans mentioned
16 Paducah. I pulled up the Paducah coworker
17 just now, and it's addressing all those items
18 that Hans just brought up on the phone.

19 **MS. MUNN:** We do that in the earlier --

20 **MR. GRIFFON (by Telephone):** I just thought
21 I'd mention this because all the discussion
22 seems to be around individual dose
23 reconstruction. But I think this TIB's pretty
24 applicable to the site profile development
25 process.

1 **MR. SMITH (by Telephone):** Yes, it is.

2 **DR. MAURO:** As I recall when we went through
3 the Rocky Flats process, a lot of our
4 discussion centered around OCAS coworker
5 models. In fact, that's most of what we
6 discussed.

7 Now the question I pose to everyone
8 around the table and on the phone, is there
9 anything that could have been put into this
10 particular OTIB-0020 that would have helped to
11 avoid the months of debate that we
12 encountered? In other words in the end as you
13 recall lots of revisions were made to the
14 Rocky Flats coworker model, whether they were
15 internal or external, I believe that was one
16 of the outcomes that there were changes made
17 in light of the discussions.

18 And the question then becomes would a
19 lot of that have been somehow avoided if, in
20 fact, more explicit guidance was given. Or in
21 retrospect, never mind then, but in
22 retrospect, now that we've been through the
23 Rocky experience, and we know where the
24 sensitive subjects were, is there anything
25 that could be done to OTIB-0020 in light of

1 the lessons learned from Rocky and its
2 coworker OTIBS that could be done to 0020 to
3 improve the process.

4 Maybe in reality, yeah, there might be
5 a problem with this OTIB and the way to
6 determine that is there anything that we could
7 do now that would help avoid similar
8 situations as we encountered on Rocky.

9 **MR. SMITH (by Telephone):** My short response
10 to that is no. The methodology used in all of
11 the revisions to OTIB-0058 were the same, and
12 they were always based on OTIB-0020. And
13 again, very claimant-favorable methodologies
14 as you'll see in looking at the final table in
15 that TIB.

16 **MS. MUNN:** Extraordinarily favorable.

17 **MR. SMITH (by Telephone):** The changes that
18 occurred with OTIB-0058 were due to the
19 repeated revisions of some of the input data
20 coming into the front end of the coworker
21 modeling process.

22 **DR. MAURO:** So it wasn't the philosophy. It
23 really was the dataset upon which the OTIB was
24 based. That's an important point.

25 **MS. MUNN:** That seems to be the recurring

1 issue is how well the data available for the
2 various sites can be applied since there's an
3 enormous variation. We've already seen a
4 staggering amount of variation between the
5 amount of information that we have and the
6 application of that information to the site-
7 specific issues that arise. They seem to be
8 very broadly distributed.

9 Mark, are you okay with the suggestion
10 that the subcommittee sort of check from time
11 to time to assume that OTIB-0020 seems to be
12 applied appropriately to the other sites?

13 **MR. GRIFFON (by Telephone):** Yeah, I mean, I
14 think generally it comes up in our site
15 profile reviews and when we cover cases in the
16 subcommittee it will come up that way.

17 **MS. MUNN:** If you're comfortable with --

18 **MR. GRIFFON (by Telephone):** Yeah, I'm fine
19 with that overall. I would answer John's
20 question in one way thought. I believe, and
21 this is only my feeling, that Section 6 in
22 OTIB-0020 could be -- and I'm just going over
23 this real time as we're on the phone so it's
24 been awhile since I looked at OTIB-0020, but
25 my sense is that some more specificity would

1 have helped.

2 And maybe this is in retrospect, you
3 know, after Rocky Flats, but some more
4 specificity as to what it meant or what should
5 be done in terms of, it says, "A sampling of
6 the data are compared," you know, that hardly
7 tells us much about the sampling. So maybe
8 more specific guidance as to what extent.
9 What's required as far as a sampling? Is
10 there a percentage? Is there a, you know.
11 How is this sampling done?

12 **MS. MUNN:** Well again, Mark, isn't that
13 going to depend largely on the dataset that
14 you have available to you? That can vary
15 enormously.

16 **MR. GRIFFON (by Telephone):** There may be
17 some site-specific issues, but I think overall
18 you want an approach across the board that's
19 going to be, you know, you want some overall
20 guidance. I would say when developing a
21 coworker model, you should at least include
22 this in your approach to sampling from the
23 claimant data to compare against your coworker
24 data. I don't know.

25 That's just a thought, but otherwise,

1 Wanda, I agree with you that we can take these
2 up in the subcommittee and site profile
3 reviews when they come for site-specific
4 issues.

5 **MS. MUNN:** All right, we can take that as an
6 action item for the subcommittee. As far as
7 your issue with respect that more definitive
8 directions regarding how to proceed with
9 sampling, I ask NIOSH if they have views on
10 that that they would share with us.

11 **MR. HINNEFELD:** I guess not sitting here at
12 the table. We'd have to consult with the
13 people who have been preparing these, you
14 know, the coworker datasets and some of that
15 and just see what exactly are we talking
16 about.

17 **MR. GRIFFON (by Telephone):** I know some of
18 it's a case by case, but I think from the
19 standpoint of having to come, you know, think
20 of down the line when you're going to have to
21 defend this coworker model what general
22 criteria do you want to be able to meet I
23 think is kind of the way I'm looking at it.
24 You know, but this is what we do for every
25 coworker model we develop.

1 And then there's going to be
2 variations as Wanda said. Every set of data's
3 going to be different and every site's
4 different. I understand that. But maybe it's
5 worth spelling some of those out in this
6 general guidance that this is what we look to
7 achieve in every one of these.

8 **MS. MUNN:** So can we go away from this item
9 with two specific action items? One for the
10 subcommittee to incorporate this into what
11 we're looking at there. The other for NIOSH
12 to check the wording of Section 6 of the OTIB
13 to see if there should be more specificity to
14 the direction with respect to sampling of
15 data. Is that fair?

16 **MR. GRIFFON (by Telephone):** Sounds okay,
17 yeah.

18 **DR. WADE:** I've got the two action items
19 captured.

20 **MS. MUNN:** Very good. We're all exhausted.
21 It's time for a 15-minute break. Please do,
22 15 minutes.

23 (Whereupon, a break was taken from 11:00
24 a.m. until 11:15 a.m.)

25 **DR. WADE:** We're back in session. Mark, are

1 you with us?

2 (no response)

3 **DR. WADE:** Mark Griffon?

4 (no response)

5 **DR. WADE:** Mark, are you on mute?

6 (no response)

7 **DR. WADE:** Mark, if you are not on mute
8 where are you? He'll be with us shortly.

9 **MS. MUNN:** I hope so. In his absence our 15
10 minutes is up. Let's return to our summary of
11 tasks three Supplement one, Rev. one.

12 The next item I see that has any ones
13 in the rating column that have any kind of
14 response is on page 24 of 37. ORAU PROC-0022.

15 **DR. MAURO:** I'm sorry. This is John. Right
16 now I'm looking at my chart --

17 **DR. ZIEMER:** OTIB-0017.

18 **DR. MAURO:** OTIB-0017 on page 11?

19 **MR. HINNEFELD:** It has no NIOSH response.

20 **DR. MAURO:** But there's no response, okay.
21 So we don't want to go there then.

22 **MS. MUNN:** No, not right now. We'll touch
23 on it to see how the responses are coming
24 after we've gone over the responses we already
25 have. If we can get anything whittled down so

1 that it comes off this matrix, or it's reduced
2 to at least one item on the matrix, it will be
3 --

4 **DR. MAURO:** I'm sorry. You were saying that
5 the next place is where?

6 **MR. SMITH (by Telephone):** Page 24.

7 **MS. MUNN:** PROC-0022, reference to the ORAU
8 procedure for our Privacy Act compliance.
9 There are two separate findings there, and we
10 had responses from NIOSH.

11 Stu, do you want to review your
12 response to see how SC&A accepts it?

13 **MR. HINNEFELD:** This is a procedure is for
14 requesting additional information, and I think
15 that would be utilized when we get late
16 information like we have a claim about
17 employment like at a DOE site or visits to
18 other DOE sites that were not part of the
19 original claim. I'm trying to catch up here
20 again.

21 The first finding has to do with
22 reference an incorrect procedure maybe.

23 **MS. MUNN:** Refers to the ORAU procedure for
24 Privacy Act compliance. Needs to be correct
25 and consistent. And the next one suggests

1 that PROC-0022 provide an overview for
2 requesting information as referred to task
3 two, task four, task five, assumes the
4 reader's familiar with each task.

5 **DR. ZIEMER:** I'm a little confused here.
6 The rating column has disappeared from my
7 chart.

8 **MS. BEHLING (by Telephone):** This is Kathy
9 Behling. Yes, when we get into the quality
10 assurance procedures which is where you are
11 right now, in fact, I think Steve Ostrow is on
12 the phone and he can help me out here. We
13 developed a checklist that's different than
14 the checklist for some of the PROCs. The
15 quality assurance checklist simply has, it
16 asks questions and the response is either yes,
17 no or not applicable, and there's no ranking
18 or rating associated with those. So
19 therefore, quite honestly I'm trying to think
20 back as to why there was a one in parentheses
21 behind this --

22 **MS. MUNN:** Well, I know why it was. That's
23 from our discussion previously that you mean
24 that's from Supplement One. That's the first
25 supplement.

1 Sorry, that's my, I was looking in the
2 wrong column, too.

3 **MS. BEHLING (by Telephone):** Yeah, these
4 quality assurance procedures do not have
5 rankings.

6 **MS. MUNN:** We're not going to look at those
7 then at this moment. I need to backpedal
8 myself.

9 I have listed PROC-0061, OTIB-0028.
10 It's OTIB-0028 --

11 **DR. ZIEMER:** It's the same issue. I think
12 it's the version rating.

13 **MS. MUNN:** We had ones on 24, but there was
14 no response yet. That's in preparation. We
15 had, 28 has responses to it. They had low
16 ratings.

17 **DR. MAURO:** All of these are QA. Here we
18 are starting on page 24, for example, may have
19 started earlier. Let me see if I can find
20 where it actually starts. Page 22.

21 **MS. MUNN:** Yeah, I've moved this back. I'm
22 back on page 13. I'm sorry about that. I
23 jumped us ahead into the quality procedures.
24 I'm back where we do have rankings and
25 responses. As I said earlier, I want to make

1 sure we do get an opportunity to look at the
2 NIOSH response regardless of the
3 classification and to make sure that if
4 there's a resolution that we can reach here
5 today that we do that.

6 As I see it, the next response that I
7 have is on page 13 for OTIB-0028. The summary
8 ratings were four and four, but we do have a
9 response from NIOSH. It says a page change is
10 going to be initiated, will include all the
11 files used. Can we assume that that meets the
12 criteria anticipated from SC&A?

13 **DR. MAURO:** I'm just getting myself a little
14 oriented here. These are the ones I believe
15 that were prepared, there are several here by
16 Joyce. The one we're looking at has to do
17 with thorium. Is that correct?

18 **MS. MUNN:** Yes, Type M Thorium.

19 **DR. MAURO:** Right and the question --

20 **MS. BRACKETT (by Telephone):** This is Liz
21 Brackett. This OTIB was written because the
22 values in IMBA are not correct because it
23 carries all the daughters through with it so
24 we had to come up with alternative dose
25 conversion factors. And this OTIB was

1 verification that the number that we were
2 using. And I somehow missed, I only listed
3 two of the files when there were actually four
4 of them. That was one of the problems.

5 **DR. MAURO:** It turns out our comment on what
6 I call, there are three in a row, one dealing
7 with thoron, one dealing with thorium and one
8 dealing with wounds. These were all reviewed
9 by Joyce. All of which got very favorable
10 reviews. There were no ones, twos, I believe
11 they're only threes. But there was some
12 general observations.

13 And I believe what you're referring to
14 is there were certain references. I believe
15 the one you're referring to is there are
16 certain documents that Keith Eckerman provided
17 that were the underpinning for the approach
18 used. And Joyce said from her review
19 everything looked fine, but she'd sure like to
20 look at those original source documents that
21 Keith Eckerman used to come up with the dose
22 conversion factors, but she didn't have any
23 problem with it. They looked like they were
24 valid, but it would be helpful if we could see
25 those source documents. I think that was the

1 extent of the comment.

2 MS. MUNN: So a page change including the
3 lifting of the file will meet your criteria?

4 DR. MAURO: Yes.

5 MR. HINNEFELD: Well, I can do that. Do you
6 want to see the files as well?

7 DR. MAURO: Well, yeah, that's what Joyce
8 asked for.

9 MR. HINNEFELD: Liz, if you would send those
10 to me, I will send them on to John.

11 MS. BRACKETT (by Telephone): Okay, thanks.

12 DR. WADE: What files are they exactly?

13 MS. BRACKETT (by Telephone): These are
14 files that Keith Eckerman generated from the
15 software that he uses to drive the dose
16 conversion factors. It's the output from his
17 program.

18 DR. WADE: Could I have his name again?

19 DR. ZIEMER: Keith Eckerman.

20 MS. BRACKETT (by Telephone): ORNL.

21 MS. MUNN: All right, so our only
22 expectation will be that page change and this
23 item will then clear.

24 MR. HINNEFELD: The page change and the
25 files.

1 **MS. MUNN:** Right.

2 There is the third item on OTIB-0028
3 on the next page --

4 **DR. MAURO:** What page number? I'm sorry.

5 **MS. MUNN:** Just the very next page. There
6 are three items on OTIB-0028. The first two
7 are on page 13, the next one is on page 14.

8 It says what should be used when it's
9 an intake of 232 or 238 and that's different
10 from five. And the response is ORAU's not
11 aware of a different ever being applied. If
12 needed we will contact Eckerman. Is that
13 adequate for the issue?

14 **DR. MAURO:** Yes.

15 **MS. MUNN:** The next response we have is down
16 that same page on OTIB-0011. We have two
17 items there with responses to them. Sounds as
18 though NIOSH is asking for clarification --

19 **DR. MAURO:** Perhaps I can help on these two
20 items. This had to do with tritium bioassay
21 and individuals that would be working in an
22 area where they're exposed to tritium, and
23 there were some intermittent bioassay samples
24 collected that might have been spaced by many,
25 many months. So in theory the person could

1 have been working in the tritium environment
2 and the clearance for the tritium I think has
3 a ten day half life. So in theory if you
4 don't take sufficient bioassays, you could
5 miss an intake.

6 And the first comment had to do, and
7 it's a four. It wasn't a very major, was that
8 it wasn't clear how do you deal with a void.
9 And I believe the comment was very simple. It
10 became clear when we read the workbook. In
11 other words there's a workbook that goes with
12 this one.

13 And when we saw the workbook, the
14 workbook provided very explicit guidance,
15 exactly what do you do when you have a void in
16 the sampling sequence. But it wasn't until we
17 read the workbook that we realized
18 everything's okay. So that's why it was a
19 four. It would be helpful if the actual
20 procedure, the OTIB, provided that explanation
21 in the text that you wouldn't have to go
22 through the workbook before you understood
23 exactly that everything's okay. That was the
24 comment that was made. So it's a relatively
25 minor comment.

1 **MR. HINNEFELD:** Well, there is some language
2 in the section called time periods with no
3 monitoring. So there is something there. I
4 guess it wasn't sufficiently clear.

5 **DR. ZIEMER:** The response, the ORAU
6 response, appears to address it.

7 **MR. HINNEFELD:** There is some wording there,
8 and maybe since the workbook is clear and
9 there's some wording there, maybe that's
10 sufficient.

11 **DR. MAURO:** That's why it was a four and
12 maybe we missed it.

13 **MS. MUNN:** We're okay?

14 **DR. MAURO:** Yes.

15 **MS. MUNN:** We're okay, those two.

16 **DR. ZIEMER:** Do you need to double check
17 that, John?

18 **DR. MAURO:** I'll go back and take a look,
19 sure. Make sure that the words are there and
20 sufficient. But quite frankly, as long as
21 it's in the workbook, in fact, let's talk
22 about this a bit.

23 If the workbook is fine but maybe the
24 procedure is not as thorough, in other words,
25 the workbook has to be complete because it's

1 mechanistic; it's all there. And there maybe,
2 so there's information in the workbook is
3 always richer and more explicit than what's in
4 the text of the OTIB by the very nature of the
5 workbook. So in my mind I like the idea, may
6 it would make life easier for everyone, is
7 they complement each other, and they're really
8 part and parcel of the same thing. That is,
9 the write up together with the workbook
10 constitutes the procedure. And if we look at
11 it that way, then there really is no comment
12 because, you know, when we did this review, we
13 actually, we looked at them as if they were
14 separate. But maybe the better way to think
15 about it is this. These complement each
16 other. And if there is any ambiguity in the
17 actual text of the OTIB that's resolved in the
18 workbook. As far as I'm concerned the problem
19 goes away. I don't know if the rest of the
20 working group would agree with that
21 interpretation.

22 **MS. MUNN:** I understood that to be the
23 philosophy at the time we put the workbooks
24 together but perhaps I was in error. Do we
25 have any heartburn with that philosophy?

1 (no response)

2 **MS. MUNN:** If not, then --

3 **DR. ZIEMER:** Now I'm wondering if maybe the
4 reviewer, maybe your reviewer wasn't aware of
5 this later section and made the comment in --

6 **DR. MAURO:** Well, I'll --

7 **MS. MUNN:** The next item is the one
8 immediately below it, also a four. ORAU OTIB-
9 0019.

10 **MS. BRACKETT (by Telephone):** Do we still
11 want another one associated with 11? I don't
12 know if you want to finish that.

13 **DR. ZIEMER:** She's talking about that one,
14 Liz.

15 **MS. BRACKETT (by Telephone):** Oh, she just
16 said 19. I'm sorry.

17 **DR. ZIEMER:** You meant 11, didn't you?

18 **MS. MUNN:** Yes.

19 **DR. ZIEMER:** It's a tritium one.

20 **MS. MUNN:** Yeah, I meant 11.

21 **DR. MAURO:** I think the issue here has to do
22 with the modeling. That is when tritium is
23 taken into the body and then it shows up in
24 the urine, there is this delay period. And
25 the comment was I believe that that delay is

1 not explicitly taken into consideration. But
2 the response, and I will stand corrected by
3 the folks who are expects on the ICRP model is
4 that it assumes instantaneous mixing
5 deliberately. And so that's the way ICRP
6 intended it to be in spite of the fact there
7 is this delay intake and when it gets to the
8 urine. So as long as everyone, that's the
9 ICRP. I wasn't aware of this. This was
10 explained to me. As long as the ICRP model
11 assumes instantaneous mixing and so your
12 intaking a -- You're assuming it's in the
13 urine, that's not a problem with the model.
14 And ICRP did it this way. Please, anyone more
15 familiar with this subject than I am, correct
16 me if that --

17 **DR. ANIGSTEIN (by Telephone):** This is Bob
18 Anigstein. I'm not sure if I understood your
19 comment correctly. Did you say that there is
20 instantaneous mixing throughout the body?

21 **DR. MAURO:** Yes.

22 **DR. ANIGSTEIN (by Telephone):** Oh, this is
23 for tritium only.

24 **DR. MAURO:** Tritium only.

25 **DR. ANIGSTEIN (by Telephone):** Okay, forget

1 it, sorry.

2 DR. ZIEMER: And you're not saying that
3 there is. You're saying that the model
4 assumes that there is.

5 DR. MAURO: In reality there is.

6 DR. ZIEMER: It only matters if somehow you
7 collected a urine sample the first minute
8 after an intake.

9 DR. MAURO: Right.

10 MS. BRACKETT (by Telephone): Or, well, if
11 you collected it within two hours.

12 DR. ZIEMER: All right, two hours.

13 MS. BRACKETT (by Telephone): It's not going
14 to have an impact on the dose calculation, but
15 it will --

16 DR. MAURO: That's why it's a five. In
17 other words it's got a five. It was a
18 comment, an observation that the reviewer
19 wanted to just point out and alert quite
20 frankly. It's unfortunate that it surfaced to
21 this degree. I don't think that it's
22 important. So I don't think we need to go any
23 further.

24 MS. MUNN: The next response we have is to
25 OTIB-0019. It was rated a four.

1 **DR. MAURO:** Bob Anigstein, are you on the
2 line?

3 **DR. ANIGSTEIN (by Telephone):** Sure am.

4 **DR. MAURO:** I believe this is the one we
5 talked about this morning or yesterday.

6 **DR. ANIGSTEIN (by Telephone):** Yes, yes.
7 OTIB-0019 actually falls into a very similar
8 category to OTIB-0020 which we discussed at
9 length earlier in terms of that it's a
10 guidance. It's not really a guidance to the
11 dose reconstructors as I understand it. It's
12 a guidance to the site expert to create a
13 separate TIB for each site which then will be
14 used by the dose reconstructors.

15 **MS. BRACKETT (by Telephone):** Yes, that's
16 correct.

17 **DR. ANIGSTEIN (by Telephone):** The problem
18 we had -- just one second. The issue with the
19 OTIB-0019 is that it gives a very
20 straightforward methodology for taking the
21 known data, the coworker data, and assigning
22 to each data point, assigning it a percentile.
23 You simply rank them.

24 And the example they give is let's say
25 you have ten data points. Then the lowest

1 value is given point 0.05 because 0.05 is
2 halfway between zero and 0.1. So it gets a
3 five percentile. The second one would get a
4 15 percentile and so on up to the tenth which
5 would have a 95th percentile. And, of course,
6 if you have more data points you use a similar
7 but finer gradation.

8 Then the OTIB instructs that these get
9 plotted. Each one of these percentiles gets
10 assigned a Z score. So by definition the 50th
11 percentile gets a Z score of zero, and as a
12 result of a normal distribution, the 84th
13 percentile will have a Z score of 1 because
14 that's one sigma, and all the others will have
15 corresponding Z scores.

16 Then there is, I use something like
17 Excel which probably people would normally
18 use, to do a regression analysis, and you plot
19 the best line, the best straight line through
20 those points. And then from that line you
21 would have two parameters, and one would be
22 the 50th percentile would come out of that
23 line. And the other one would be the slope of
24 the line would be the geometric standard
25 deviation. So all of this is straightforward

1 statistics, and it was originally reviewed by
2 Dr. Harry Chlmynski who has a doctorate in
3 statistics. And he found the statistics to be
4 fine.

5 The point we did object to is it then
6 goes on to say, well, make sure that it's a
7 lognormal distribution because what you plot
8 is the logarithms of the values of the doses,
9 the doses or intakes. And to make sure it's a
10 lognormal distribution, you calculate the R
11 squared. And normally, in ordinary statistics
12 when you have two independent, you have a
13 measurement that has two values attached to
14 it, two independent variables.

15 And you then do an R squared to
16 determine the amount of correlation between
17 these two variables. And if you have an R
18 square of 0.9, that's considered a good
19 correlation. If you have an R square of 0.7,
20 it's reasonable and probably valid,
21 acceptable.

22 That does not apply in this instance
23 because you already have guaranteed that
24 regardless of the form of the distribution by
25 ranking the values and assigning a Z score to

1 each value, you've already guaranteed that
2 there will be a monotonically increase in
3 function. Meaning that each, any time you
4 have value K, and then you have value K plus
5 one, the value will be higher, and it will
6 also have a higher Z score.

7 So whether there's a straight line or
8 not, you'll always have this curve that starts
9 at the bottom left and goes to the top right.
10 So you will always get a good R square even --
11 and Harry Chlmynski quotes some papers and the
12 discussion this morning -- that they made up
13 some perfectly arbitrary distributions, and
14 they always get an R square of 0.98. That's
15 the authors of this work that refers to. So
16 this is simply not a valid test on whether or
17 not you have a lognormal distribution.

18 There are other tests. There's a
19 number of statistical tests that can be
20 applied to determine how likely it is that a
21 distribution is lognormal, but they are not
22 mentioned here in this OTIB. So that's the
23 brunt of the criticism.

24 And then the nature of the outcome is
25 that if you're trying to take, say, the 95th

1 percentile of that from the distribution as
2 opposed to the real 95th percentile, meaning
3 that you had a hundred values, then the 95th
4 percentile would be the 95th value starting
5 from the bottom, you might get very different
6 values if the thing sufficiently deviates from
7 lognormal. It even has a high-end tail. So
8 that's our objection to this.

9 **MS. BRACKETT (by Telephone):** But there is
10 another test that isn't documented in the OTIB
11 where we do, the information that's included
12 on the spreadsheet that comes out of this,
13 there's the fitted 50th and 84th percentiles,
14 and there's the actual, you know, looking at
15 the ranking to look at a comparison of them to
16 see if they are very different.

17 **DR. ANIGSTEIN (by Telephone):** Yes, I
18 noticed that. That they do, that it does
19 specify, as a matter of fact, it doesn't even,
20 the OTIB does not make clear. Thus, it does
21 give you two different ways of calculating the
22 84th percentile and the GSD which was the ratio
23 of the two. And it's not clear to the reader
24 why there are two different ways, but as you
25 explained, that should be, one with inside

1 knowledge would know, yeah, that must be what
2 they're doing. But that should be made
3 clearer in the OTIB, I think.

4 **MS. BRACKETT (by Telephone):** There is a
5 procedure that gives more details of doing the
6 calculations, Procedure 95, that was written
7 kind of a sub-document to this one that gives
8 the person running the statistics the specific
9 details of how to do it. I'm not sure if
10 that's covered in there, but that does go
11 along with this and does give more detail.

12 **DR. ANIGSTEIN (by Telephone):** I see. Okay,
13 that's good to know. I do not believe we
14 reviewed that procedure.

15 **MS. BRACKETT (by Telephone):** It came a bit
16 after this one.

17 **DR. ANIGSTEIN (by Telephone):** I see. Okay,
18 that would explain it.

19 **MS. MUNN:** So what is our action here? Is
20 someone going to verify that the follow-on
21 procedure, that was the issue?

22 **MS. BRACKETT (by Telephone):** It won't
23 settle the issue because it doesn't address
24 other, it doesn't address any other tests. It
25 just does give a little more information about

1 how the statistics are run.

2 **DR. ZIEMER:** Liz, is that procedure the one
3 called Generating Summary Statistics for
4 Coworker Bioassay Data?

5 **MS. BRACKETT (by Telephone):** That sounds
6 like the right title, yes.

7 **DR. ANIGSTEIN (by Telephone):** I mean, as a
8 sort of a lay statistician I would just
9 mention that there's something called a W test
10 which is one that can be applied to determine
11 lognormality, and there are several others.

12 **DR. NETON:** There's also the Kolmogorov
13 Smirnov test.

14 **DR. ANIGSTEIN (by Telephone):** Yes.

15 **DR. NETON:** It seems to me we need to go
16 back and just look at this again, and in light
17 of what Bob just talked about with the R
18 squared values.

19 **MS. BRACKETT (by Telephone):** Sure. One
20 thing I will mention is we've discussed many
21 times what would be the alternative to
22 lognormal. This is to determine if it's a
23 lognormal, but we haven't really come up with
24 any better alternative to what it could be.
25 Because then if you determine it's a different

1 distribution, then you have the issue of how
2 you enter the output into IREP since it only
3 has a limited number of distributions.

4 **MS. MUNN:** Can we have an offline discussion
5 of our technical people to see if you can
6 resolve this?

7 **MS. BRACKETT (by Telephone):** Sure.

8 **MS. MUNN:** And report back to us at our next
9 meeting. It would be very nice if the two of
10 you could resolve whether there is, indeed, a
11 problem or whether it is taken care of and
12 just not obvious to the casual reader. I'll
13 expect a report back at our next meeting.
14 Okay? Can you do that?

15 **DR. ANIGSTEIN (by Telephone):** Fine by me.

16 **MS. BRACKETT (by Telephone):** Who's making
17 the report?

18 **MR. HINNEFELD:** We will. We'll task around
19 the program.

20 **MS. BRACKETT (by Telephone):** Okay.

21 **MS. MUNN:** Thank you.

22 **DR. ANIGSTEIN (by Telephone):** Excuse me. I
23 didn't get the name of the lady who had just
24 discussed the statistics.

25 **MS. BRACKETT (by Telephone):** This is Liz

1 Brackett with the O-R-A-U team.

2 **DR. ANIGSTEIN (by Telephone):** Liz Brackett.

3 **MS. MUNN:** The next response that we have
4 has a rating of three, ORAU OTIB-0033, and we
5 have a NIOSH response. The OTIB was developed
6 to give guidance to the judgment the DRs must
7 document their rationale for selected
8 categories based on information in the
9 worker's file. Is that acceptable to SC&A?

10 **DR. MAURO:** To step back a little bit on
11 OTIB-0033. What this is is, unfortunately,
12 this is part and parcel to a bigger score. It
13 has to do with coming up with, when you don't
14 have adequate bioassay data, and you don't
15 have sufficient air sampling data, but you do
16 have a Health Physics program in place whereby
17 the DOE order is in effect. You've identified
18 different sections of a facility that
19 radioactively contaminated area, airborne
20 contamination area where you have a degree of
21 control over access to areas with airborne
22 radioactivity.

23 That's the setting. That is, that
24 we're in a situation where you have in place a
25 well documented radiation protection program.

1 Now stay with me for a minute. The idea here
2 is, I think this is an important issue because
3 it goes to the fundamental approach for
4 creating surrogate data or surrogate approach
5 to doing dose reconstruction where when you
6 have very limited information about the
7 exposure a worker may have experienced -- and
8 certainly if I'm mischaracterizing it, help me
9 out -- but and so what happens as follows.

10 So we have a facility that has a
11 robust radiation protection program, then a
12 degree of confidence that access to areas with
13 elevated airborne radioactivity is controlled.
14 Under those circumstances one could argue that
15 it's very unlikely that anyone working at that
16 facility will have entered an area for
17 protracted periods of time where the
18 concentration of the radioactivity in the air
19 is above the maximum physical concentrations,
20 the MPCs. So that's a given as we have this
21 control in place.

22 Now, one could argue that, all right,
23 if we want to place, here we have a worker.
24 We want to place an upper bound on what he
25 might have inhaled. We have a lot of options.

1 We say, listen, one of the things we can do,
2 we don't have any bioassay data for him, but
3 one thing we can say with a high degree of
4 confidence is that because he worked for this
5 facility at a time when there was a robust
6 radiation protection program, there's no way
7 he was exposed 2,000 hours per year to
8 radionuclides at a level in the air that were
9 above one MPC for the worst radionuclide, like
10 Strontium-90. So that sort of puts a lid on
11 it. That sort of sets the stage. That's
12 OTIB-0018 by the way.

13 Then you said, well, hold it. Hold
14 it. So we're not going to assume that a
15 worker was exposed 2,000 hours per year at an
16 MPC of the worst possible radionuclide. We've
17 got to find a way to tone it down to make it a
18 little bit more realistic so that we can make
19 decisions regarding compensation and denial on
20 a more realistic basis. And that's where 33
21 comes in.

22 Thirty-three comes in and says, well
23 listen, this is what we're going to do.
24 Depending on the year and a number of other
25 parameters that characterize this person's job

1 function and the years in which he worked,
2 we'll assume that he's at some percentile of
3 an MPC of exposure. That is maybe ten percent
4 of an MPC or five percent of an MPC.

5 So there's an overall strategy that's
6 adopted here that brings you to a place that
7 says even though we don't have bioassay data
8 for this particular worker, we probably can
9 place a plausible upper bound on what he may
10 have chronically been exposed to while working
11 at this facility at this time. And it
12 effectively means that we'll take the MPC to
13 the worst radionuclide he might have been
14 exposed to, and then, depending on a number of
15 parameters related to his job function and the
16 year that he worked, we're going to assume
17 he's at some percentile of the MPC and then do
18 a dose calculation.

19 Now, the criticism that we had related
20 to this is there's a lot of judgment here, and
21 not only that, it's confounded by some of the
22 criticisms we have with OTIB-0018. So it's
23 hard for us to discuss OTIB-0033 in a vacuum
24 because OTIB-0033, all it really says is,
25 well, apply this adjustment factor to OTIB-

1 0018, you know, the MPC, under these
2 circumstances or use this adjustment factor.

3 So our concern, and this is one way
4 perhaps to really get our arms around a
5 multiple set of OTIBs. The whole idea that
6 doses can be reconstructed for workers without
7 any bioassay data based on a premise that
8 there was a radiation protection program under
9 DOE Order 15, whatever the DOE Order is. And
10 thereby there's assurance that their access
11 controls were there. And then given that,
12 that in itself is, there's some questions that
13 we should discuss.

14 But then superimposed on that is the,
15 what I consider to be, the somewhat arbitrary
16 selection of adjustment factors like 0.1 or
17 0.5 of an MPC based on a variety of parameters
18 that one could assign to that worker. And so
19 our concern goes toward that. That is,
20 there's an awful lot of judgment. There's an
21 awful lot of presumptions embedded in what I
22 call the OTIB-0018-slash-OTIB-0033 strategy
23 for reconstructing internal doses.

24 And I guess I'd have to put it back
25 out to NIOSH whether or not I've accurately

1 characterized that combo of OTIBs and your
2 sense on whether or not that is, in fact, a
3 weakness that you see also.

4 **MS. BEHLING (by Telephone):** Excuse me,
5 John. Can I just add to some things that you
6 said?

7 **DR. MAURO:** Please, yes.

8 **MS. BEHLING (by Telephone):** I'd just like
9 to make it very clear to the work group.
10 OTIB-0033, as you indicated, applies a graded
11 approach to the OTIB-0018. And OTIB-0018 is
12 an overestimating approach that was designed
13 to replace or that is used, in fact, quite
14 often right now, OTIB-0002. And OTIB-0002,
15 the difference now is OTIB-0002, you were not
16 allowed to compensate using OTIB-0002. But
17 the combination of OTIB-0033, this graded
18 approach along with the OTIB-0018 does allow
19 that dose reconstructor to compensate a case.

20 **MS. BRACKETT (by Telephone):** That's not
21 correct.

22 **MS. BEHLING (by Telephone):** Okay.

23 **MS. BRACKETT (by Telephone):** It's still an
24 overestimating technique, and it's not
25 intended to use for compensable cases.

1 **MS. BEHLING (by Telephone):** Thirty-three is
2 not?

3 **MS. BRACKETT (by Telephone):** No.

4 **MS. BEHLING (by Telephone):** Because the
5 title of 33 I thought is Assumption for
6 Processing Best Estimate Cases, but it's still
7 not to be used for compensating? Is that
8 correct?

9 **MS. BRACKETT (by Telephone):** Well, that's a
10 good point because it brings in OTIB-0014
11 also, which can be used for best estimates.
12 But the overestimating assumptions are still
13 not to be used for compensable cases. It was
14 written during the time where for a short time
15 we were doing compensable cases based on these
16 types of things, but that's not the case now.

17 **MS. BEHLING (by Telephone):** Okay, because I
18 have seen cases where they've applied, and I
19 was under the impression that the OTIB-0033,
20 once you apply that graded approach, you could
21 compensate because I have to go back and
22 convince myself that I was quite sure that
23 we'd seen some cases where there have been
24 compensations using OTIB-0033.

25 **MS. BRACKETT (by Telephone):** Well, as I

1 said, when it was first written there was a
2 short time when that was being done, but that
3 should not be the case now. That's not the
4 intent of it.

5 **MS. BEHLING (by Telephone):** Okay, maybe
6 that should be something that's clearly stated
7 in this OTIB-0033 at this point.

8 **DR. MAURO:** That's important. Our
9 understanding, and even I think the language,
10 in 33 was, that was the reason why 33 was
11 written so that you would not, that you had a
12 way to reconstruct doses a little bit more
13 realistically and compensate or deny --

14 **DR. ZIEMER:** It does have best estimate in
15 the title.

16 **DR. MAURO:** Yeah, so I guess that needs to
17 be fixed. If, in fact, 33 in combination with
18 18 is, in fact, being used as an upper bound
19 for denial only, that's very much different
20 than our understanding.

21 **MS. MUNN:** How can we fix it?

22 **MR. HINNEFELD:** Well, there might be two
23 things to fix here. One is to sort out the
24 debate and, if necessary, change the title on
25 this OTIB. If it's strictly an overestimating

1 OTIB, it shouldn't have this in the title. I
2 think there may be some historical
3 explanation. I think I might know what the
4 history is or why this was used in
5 compensating cases. But I want to make sure I
6 get it right so I'll do that.

7 And then the other issue may be a
8 broader discussion of the combination of 18
9 and 33 and what ever, you know, take a look at
10 the combined issues on those and see what we
11 can do in terms of a combined response and why
12 we believe the approach is a good approach. I
13 mean, that might be the other thing to do.

14 **MS. MUNN:** So you're going to do a two-
15 pronged review. One to see whether changes
16 need to be made directly to 33, and also to
17 verify that it is being properly incorporated
18 into the overall activity of dose
19 reconstruction.

20 **MR. HINNEFELD:** Well, in combination with 18
21 what we want to do is take the finding, review
22 18 as well. Review the findings for 18 and
23 review the findings for 33 and see what we can
24 come up with in terms of a consistent
25 response.

1 **DR. MAURO:** And within that context we had a
2 much more serious (unintelligible) 18 than we
3 did with 33. In other words, 33 there was
4 this adjustment factors which you could say
5 were reasonable, you know, applying this
6 adjustment. Because people aren't going to be
7 exposed to the MPC, but it's hard to escape
8 18. Because, see, 18 is interesting.

9 It says that, listen, we have a
10 general air sampling so that we know what the
11 airborne radioactivity is in different areas
12 in the plant. And on that basis we could say
13 with a high level of confidence that if a
14 person, you know, a person's not going to be
15 allowed to enter an area with concentrations
16 in air that approach or exceed.

17 In fact, in recent times I believe
18 respiratory protection is required when you're
19 ten percent of the MPCs. So in recent times
20 it's not going to happen. But our problem,
21 and you'll see we're sort of crossing into 18
22 but you can't help but do it, is that general
23 air samplers, we are finding that there's no,
24 there's very little relationship between the
25 Becquerels per cubic meter you get off of

1 general air sampler and the Becquerels per
2 cubic meter that you get off a lapel.

3 And therefore, we question whether or
4 not you could even use OTIB-0018's data that
5 you would get from a general air sampler as a
6 reliable indicator of what a person's exposure
7 might be. And Hans has done some research on
8 this, and when we get to 18, you'll see that -
9 - I think this is an important concept --
10 general air samplers have very serious
11 limitations when it comes to dose
12 reconstruction, and we the information in the
13 review of 18 in this very document we're
14 looking at now.

15 And I think that is a very important
16 subject that needs to be discussed. Now
17 whether you want to do that now or when we get
18 to it, but they're linked. The two are linked
19 and 18 really is where we have the greatest
20 concern, more than we have with 33.

21 **MS. MUNN:** We established NIOSH is going to
22 look at it and see how the two mesh so we'll
23 expect that report as well.

24 The next response we have is not even
25 rated, but it has responses for OTIB-004. Was

1 whether to allow further reassignment of the
2 parameters not available.

3 **MR. HINNEFELD:** This is a question about the
4 use of breathing rate. You know, 1.2 is kind
5 of what's normally used in calculating, in
6 using breathing rate. So the question is does
7 a person breathe hard for eight hours a day
8 and includes some portion of heavy breathing
9 and some portion of that. So that's
10 incorporated. Some amount of heavy breathing
11 is incorporated into the one-two meter.

12 **DR. MAURO:** I don't know if it was given a
13 score.

14 **MS. MUNN:** No, it doesn't have a score.

15 **DR. MAURO:** There may be a five here. In
16 other words this --

17 **MS. MUNN:** Well, we have a whole gaggle of
18 comments on OTIB-004, and since we have a half
19 dozen, actually seven, eight, nine, ten, we
20 have ten comments on four. And it would be
21 very nice if we could take a moment, read
22 through NIOSH's response and see if they're
23 adequate for the concerns that were raised
24 when the findings were first put forward.
25 Let's take a moment to take a look at those.

1 **DR. ZIEMER:** And the reason these weren't
2 rated is?

3 **DR. MAURO:** I'm trying to find it.

4 Kathy, by any chance -- I'm just
5 trying to find the page number so I can take
6 another look at four because I was part of the
7 review team.

8 **MS. MUNN:** It's on 15.

9 **DR. ZIEMER:** In their report it's pages 138
10 to 40.

11 **MS. MUNN:** Thirty-seven, 38 and all the way
12 down to 45. So there's ten pages of report
13 data.

14 (Whereupon, the work group reviewed the
15 report.)

16 **MS. MUNN:** So can we address and agree on
17 any of these?

18 **DR. MAURO:** Yeah, I can go through them now.
19 I was trying to get myself re-oriented.
20 Mark's found them and Mark's found them pretty
21 quickly.

22 We'll start with the very first one on
23 page 15, the third row down. This has to do
24 with the breathing rate. We've been having
25 this discussion on breathing rates for quite

1 some time. We recognize that 1.2 cubic meters
2 per hour is the recommended and ICRP.

3 However, at the same time one of the
4 concerns that we raised -- and this came up on
5 a number of occasions when we deal with AWE
6 facilities -- and OTIB 004 is basically
7 dealing with uranium facilities. Where our
8 understanding is, this is pretty hefty, heavy-
9 duty work. They've lifting, moving uranium
10 logs and billets and rolling. So I guess this
11 is a general observation regarding that class
12 of work.

13 AWE facilities that are doing uranium
14 metal working. The physical activity is
15 intense and so as a general comment whether or
16 not that default assumption is, in fact, a
17 good one when it comes to this class of
18 workers. That's the concern. I think it came
19 up before. On Bethlehem Steel I think we went
20 with 1.7 cubic meters. Now whether or not you
21 want to make it universal, that was our
22 concern.

23 **DR. NETON:** I think what happens here
24 though, how much of an overestimate do you
25 want. This is an overestimating technique.

1 We've already acknowledged this is an upper
2 bound exposure, upper bound chronic exposure
3 that requires an overestimate. How many
4 layers does one want to put on top of these
5 already overly estimating techniques.

6 **DR. MAURO:** Let's step back. What OTIB-004
7 does, the really important heart of it, is
8 what you want to do is you want to place an
9 upper bound on what AWE worker might
10 experience for the purpose of denial. I
11 believe that's still the case. And when all
12 is said and done what's done is they reviewed
13 the literature on AWE facilities and how much
14 uranium is in the air.

15 And they said, well, you know, looks
16 like chronic exposure at 100 MAC is an upper
17 bound, and we agreed with that. That's a good
18 number. So I don't want to leave the
19 impression that we didn't have a serious
20 problem with this one. The commentaries are
21 almost like what I would say, by the way, you
22 may want to take a look at this. So with
23 regard to inhalation though, 100 MAC we
24 consider to be a solid value.

25 The other thing that's, that's very

1 important in OTIB-004 is that we're worried
2 about external exposure. And what was done
3 there is that they were assuming that, okay,
4 here we have an ingot of uranium. And we're
5 going to assume a person is standing one foot
6 away from it 2000 hours per year. As far as
7 we're concerned that is off the charts.

8 So I want to make sure that everyone
9 here understands that when it comes to the two
10 fundamental pathways by which workers are
11 exposed. That is airborne dust floating
12 during the uranium metalworking operation and
13 the external exposure from being working
14 adjacent to uranium. The methods used in
15 OTIB-004 we consider to be valid.

16 Now we have the second order, that are
17 commentaries. Given that context we can
18 quickly go through, the first one had to do
19 with the breathing rate. Jim, I hear what
20 you're saying and I understand, and I have no
21 problem with that.

22 **DR. NETON:** Probably just a little more
23 because if you think about these 100 MAC
24 values, it's more than likely these are
25 already at the 95th percentile of a possible

1 range --

2 **DR. MAURO:** In fact, we did an analysis.
3 It's about the 90th percentile.

4 **DR. NETON:** It's in the upper range. So if
5 then if one is superimposed on top of that
6 what we consider the best estimate of their
7 inhalation. We've got this range of values of
8 huge, I mean, way out there in the number of
9 standard deviations involved with probably
10 what would be the best estimate. When you
11 look at it in that context these other
12 modifiers are trivial corrections, John, in
13 the overall --

14 **DR. MAURO:** I agree with you.

15 **DR. NETON:** If you go from 1.2 to 1.7 to
16 modify the oronasal breathing pattern. The
17 second order correction on something that's
18 already been out there.

19 **DR. MAURO:** I agree with you.

20 But there are places where we do have
21 some concerns on OTIB-004. Some are more
22 important than others. One has to do with the
23 recycled uranium. Embedded in OTIB-004 is,
24 okay, at some of these facilities I'm going to
25 have recycled uranium after 1952 or '53,

1 whatever the date is.

2 And again, we didn't give this a high
3 rate, but the basis for the recycled uranium
4 composition. Parts per million is not cited.
5 I believe there was limited discussion, and I
6 can see by your response you're currently
7 looking at that. That is, I could see.

8 We leave the breathing area and go
9 down, I guess, toward the bottom of the page.
10 I see an OTIB on recycled uranium is currently
11 under development. So I guess what I'm
12 hearing is that any questions we have related
13 to the basis for the value selected in OTIB-
14 004 as a default composition of recycled
15 uranium. The basis for this is under
16 development or has been developed since we did
17 this review. That may be the case.

18 **MR. HINNEFELD:** It is under development.

19 **DR. MAURO:** It is under development. So
20 that's where we are on that. Since it's under
21 development I guess then the question becomes
22 once that's done there needs to be a level of
23 assurance that, yes, the values in OTIB-004
24 are, in fact, compatible and consistent with
25 what one would consider to be an upper bound.

1 I told Jeff I recently looked at some of the
2 plutonium recycled numbers on ten parts per
3 billion. In other words, no AWE facility ever
4 received any uranium that was greater than, I
5 believe, ten parts per billion of uranium.
6 That was sort of like a spec. Now that's not
7 with Paducah or anything like that but AWE's
8 that big metalworking. And so I've since
9 learned that. Now I haven't gone back to
10 check to see if that's the number you have
11 here.

12 **MR. HINNEFELD:** I don't even know.

13 **DR. MAKHIJANI:** But 10 ppb is in TIB-004,
14 but I have a question. Was TIB-004 restricted
15 to metalworking only and not the chemical
16 facilities where you might have had the
17 raffinate problems and concentrations and out-
18 of-spec plutonium?

19 **MR. HINNEFELD:** It was at one time. Joe
20 Guido's on the line. He might be able to shed
21 some more light on this.

22 **MR. GUIDO (by Telephone):** Yeah, we're not
23 the, there's uranium ore raffinates that's not
24 being used.

25 **DR. MAKHIJANI:** No, no, it wasn't about ore

1 raffinates, but would it be --

2 **MR. GUIDO (by Telephone):** Uranium ore or
3 raffinates?

4 **DR. MAKHIJANI:** Would it be used at some
5 facility where any chemical processing of
6 uranium was happening? Any for other than
7 metal was present?

8 **MR. GUIDO (by Telephone):** There's a matrix
9 in the back of OTIB-004 that shows the
10 facilities, and it's applicable to, and we can
11 look through those and see. I'm not sure what
12 you mean by other processing.

13 **DR. NETON:** It must have been. It had to be
14 pure uranium I think because otherwise the 100
15 MAC for uranium wouldn't apply because, you're
16 right.

17 **MR. GUIDO (by Telephone):** It's a uranium
18 facility, but I'm not sure --

19 **DR. MAKHIJANI:** I don't know these well
20 enough to be able to say --

21 **MR. GUIDO (by Telephone):** -- uranium metal
22 facilities --

23 **DR. MAURO:** Well, I can say this. When I
24 reviewed the literature that stands behind the
25 100 MAC, amongst the literature was, for

1 example, Harshaw Chemical Company which did
2 have levels well above 100 MAC, and Harshaw
3 was refining uranium. In other words it
4 wasn't limited to just metalworking. So it
5 wouldn't be bounding.

6 **DR. NETON:** We kind of looked at these.
7 There was an upper tier called the Big Five or
8 Seven. And there were a number, and they were
9 big producers, Mallinckrodt, Harshaw, but we
10 know immediately below there was a whole
11 second tier that didn't fall under that
12 category at all, and that's where the intent -

13 -

14 **DR. MAURO:** And within that context I would
15 agree that 100 MAC is the right number, but --

16 **DR. NETON:** They're higher than 100 MAC air.

17 **DR. MAURO:** But this time we have an average
18 now.

19 **MR. SHARFI:** But Harshaw's not one of the
20 listed sites.

21 **DR. NETON:** It's not. It wouldn't be. I
22 think it's even discussed somewhere in that
23 TIB that the rationale was that they were
24 second tier, called mom and pops, minor
25 players in the uranium cycle there. It would

1 apply to the original producers.

2 **DR. MAURO:** That was my understanding also
3 when I looked at it, and that's why I came
4 down with 100 MAC as being certainly a
5 reasonable upper bound for the purpose of
6 denial.

7 So to go back, we're up to the part of
8 the bottom of page 15 dealing with recycled
9 uranium. And the bottom line on that is as
10 long as, the way we see it, as long as the
11 selected values in OTIB-004 for default do, in
12 fact, represent a plausible upper bound, a lot
13 might be contained in the recycled uranium at
14 metalworking facilities. That's fine because
15 right now when I looked at it, I wasn't able
16 to make that judgment. Since doing this
17 review which was, I believe, about a year ago,
18 I have learned a bit about recycled uranium.
19 And I guess the question is if they used ten
20 parts per billion of it, that's probably the
21 right number. So that solves that. So maybe
22 we solved the problem. It's covered. Ten
23 parts per billion. Now I don't know about the
24 others. I don't remember the neptuniums and
25 the techniciums where they came in. But

1 plutonium was always the driver anyway because
2 we're dealing with the inhalation pathway
3 here.

4 **DR. MAKHIJANI:** Well, that's not entirely
5 true, John. And neptunium could be sometimes.
6 It depends on the circumstances. Would that
7 be right in your experience?

8 **DR. MAURO:** Yeah, okay.

9 **DR. NETON:** It's not a huge dose
10 contribution. We limited it to ten parts per
11 billion. I think it's what, like ten percent
12 of the total dose or something like that.

13 **DR. MAKHIJANI:** That's correct.

14 **DR. NETON:** That was the basis for that ten
15 parts per billion.

16 **MR. GUIDO (by Telephone):** This is Joe. The
17 numbers in there is based on ten ppb
18 Plutonium-239. It's in Table 3-1. It gives
19 you the ppb and the fraction.

20 **MS. MUNN:** So to try to wrap this up the
21 only real outstanding issues of major
22 significance of 004 have to do with TIB-0053
23 currently under development. When that
24 occurs, when that's done, do you have any feel
25 at all for what the timeline looks like?

1 **MR. HINNEFELD:** I don't, no.

2 **MS. MUNN:** When OTIB-0053 is done, it will
3 be made available to all of us, and SC&A will
4 take a look at it to see if it resolves the
5 issues that we have listed here, all of them
6 with respect to TIB-004. Is that the correct
7 action?

8 **MR. HINNEFELD:** Well, there's an issue of
9 oronasal breathing in here which is --

10 **DR. NETON:** I think that falls into the same
11 category as breathing, you know. In fact,
12 we're going to discuss this at the Board
13 meeting coming up time permitting, the
14 oronasal --

15 **DR. ZIEMER:** As a practical matter, for
16 example, on heavy breathing, it can't
17 practically be carried out on a chronic basis,
18 can it? There's some limit as to how long a
19 person --

20 **DR. MAURO:** You hyperventilate.

21 **DR. ZIEMER:** Yeah, do we have a similar
22 figure on even moderate or what's the
23 intermediate? I mean, the light breathing
24 includes some heavy and moderate, but as a
25 practical matter I'm not sure a person can

1 engage a moderate level for --

2 DR. NETON: That's correct.

3 DR. ZIEMER: -- eight hours a day or ten
4 hours a day or whatever it is.

5 DR. NETON: I've got a report that's in
6 draft form where we've gone through and looked
7 at a number of these global issues. I'm kind
8 of getting ahead of the agenda, but it is true
9 that in the literature you cannot breathe at a
10 heavy rate for a sustained pace otherwise you
11 hyperventilate. And that's the data on that.

12 DR. ZIEMER: But those workers have to stop
13 and rest if only to get their breathing back
14 to normal.

15 DR. MAURO: Before they pass out.

16 MS. MUNN: Hopefully, we'll hear a lot about
17 that after lunch, right?

18 DR. NETON: One or two sound bytes more than
19 that. I could talk more about the oronasal
20 than the ingestion pathway.

21 DR. ZIEMER: Even if you could do moderate
22 breathing eight hours a day, that's not going
23 to change the final number by more than a few
24 percent anyway.

25 DR. NETON: It would be pretty much

1 proportioned to the breathing rate if you had
2 an air model. Now, this, of course, is not
3 relevant when you have a bioassay-driven
4 calculation. It's only in the air models
5 where it becomes a possible problem. But it
6 could change the numbers now 20 percent, 30
7 percent. But again, I could talk about that
8 when we get into the other issue I think.

9 **MS. MUNN:** I think we should because looking
10 at the time, I had hoped we would be able to
11 get through the OTIBs.

12 **DR. MAKHIJANI:** I'm just gong to add a
13 request about this particular one. Could we
14 confirm that we're only dealing with metal
15 facilities in this TIB? Because otherwise I
16 think --

17 **DR. NETON:** Yeah, I agree with you. If it's
18 being applied to facilities that process
19 (unintelligible). Now it could be a facility
20 that processed pure uranium materials and
21 dissolved it and --

22 **MR. HINNEFELD:** Unless it was recycled.

23 **DR. NETON:** Right.

24 **MR. HINNEFELD:** Because if it was recycled
25 there's another complication.

1 **DR. MAKHIJANI:** Just to clear up that
2 potential, it doesn't look like non-metal
3 facilities, but just to confirm that.

4 **MR. GUIDO (by Telephone):** The document
5 mentions, I mean, the Sections 3.0 is uranium
6 metal handling facilities, I mean, it's all
7 here in forged uranium metal handling
8 facilities.

9 **DR. NETON:** Yeah, I'm pretty sure it's one
10 of the two. I can't think of anybody outside
11 the big original ones that actually did any
12 ore processing.

13 **MR. GUIDO (by Telephone):** I was looking for
14 a caveat in it that says, I mean, I think it,
15 I'm trying to read through to see what exactly
16 it says that you can't do it. I know all the
17 sections it's talking about uranium metal
18 facilities. That was the understanding;
19 that's what this was for.

20 **MS. MUNN:** But the current wording
21 identified metal --

22 **DR. MAKHIJANI:** My only question was does it
23 exclude, that it should, with these numbers,
24 it should exclude chemical processing of
25 uranium. And I haven't read the whole thing

1 recently, but maybe that caveat should be in
2 there if it's not in there.

3 **MR. GUIDO (by Telephone):** That's what I'm
4 looking for, an exclusion.

5 **DR. NETON:** Well, I mean, the list is there,
6 and by definition, and it's excluded if none
7 of those are chemical facilities. We'd have
8 to look through and make sure.

9 **DR. MAKHIJANI:** That's the only request that
10 I have.

11 **DR. WADE:** We captured.

12 **MS. MUNN:** So NIOSH is going to look at it
13 to assure that it's metal only.

14 **DR. WADE:** And excludes chemical processing.

15 **MS. MUNN:** All right.

16 **DR. MAURO:** There are a couple of additional
17 issues related though that we would probably
18 want to close out because we're almost there.

19 **MS. MUNN:** Good.

20 **DR. MAURO:** On page 16 of the matrix,
21 starting on the one, two, the third row from
22 the bottom, there are two concerns that are
23 raised. One has to do with the medical X-
24 rays. In effect, what's happened here is we
25 expressed concern that, and this is a cross-

1 cutting issue, the approach that is used right
2 now for doing dose reconstructions for medical
3 surveillance programs where workers get their
4 initial X-ray, and then every year they get an
5 X-ray.

6 We have a standing concern regarding
7 the protocol in, I guess it's OTIB the work
8 that he did. I forget the number. We're very
9 much in agreement with the default set of
10 numbers that are being used for her
11 examination. In other words there's a
12 coworker table that says her examination for
13 breast, lung or whatever, here's the dose.
14 And it gives it for chest X-ray, lateral and
15 also fluoroscopic. So the unit exposures, we
16 looked at that. We had one of our
17 specialists, a fellow named Harry Pettingale*.
18 We looked very carefully at that.

19 The overarching concern we have though
20 is that there are issues related to retakes
21 whereby multiple measurements are made. And
22 then there's a general philosophy I believe
23 that has been embraced, and maybe you've
24 already resolved it your satisfaction, that
25 there's a lot of other opportunities for

1 workers to receive X-rays during the course of
2 his employment that were not taken into
3 consideration.

4 And in our review, I guess it's OTIB-
5 009, I think its, no, it's not OTIB-009. Our
6 review of OTIB-0060, 61. Procedure where
7 we've identified the particular issues or
8 questions that we've raised. So anyway, it
9 emerges here again because for all intents and
10 purposes in this OTIB you've adopted that. In
11 other words this OTIB-004 when it comes to a
12 medical section adopts that procedure. So
13 thereby the comments we have on the medical
14 procedure carry over to this also.

15 Whether or not it's appropriate to
16 discuss here, I just want to alert the Board
17 that that, there are a series of questions and
18 concerns we have related to medical X-ray dose
19 reconstruction and them already delineated in
20 our review of the applicable OTIB that also
21 have applicability here. And maybe we'd leave
22 it at that.

23 **MR. HINNEFELD:** I think Procedure 61 is on
24 the --

25 **DR. MAURO:** It's on the agenda.

1 inhale. I'm thinking back now that that ended
2 up with a result that seems reasonable because
3 we looked it. We came at it from another
4 perspective and checked some numbers.

5 And Bob Anigstein's probably on the
6 line. He's the one who checked it and said in
7 the end you come up with a time-integrated
8 intake from the residual radioactivity that
9 seems to be appropriate, reasonable and
10 bounding.

11 But mechanistically, taking 50 MAC as
12 your starting point and then the one percent
13 per day sort of, the way we look at it,
14 fortuitously ended up with a result of the
15 time-integrated intake during the residual
16 activity period was a pretty good number. I
17 would say that the fundamental assumption upon
18 which it's based really did not have a basis,
19 you know, the 50 MAC and then the one percent
20 per day. And so in a funny sort of way we
21 agree with the outcome, but the method to get
22 there was troubling to us.

23 **MR. HINNEFELD:** I think residual is one of
24 those issues that's now one of our global
25 issues.

1 **DR. MAURO:** This is different than the way,
2 in all the other the residuals is across the
3 board. In fact, I'm looking at TBD-6000 right
4 now, and it's addressed there. In fact, it's
5 addressed everywhere. And by and large the
6 method that keeps being used is this method is
7 one that was used.

8 There's another method that's used at
9 again cross-cutting is this idea that you have
10 dust in the air at some level, and that it's
11 falling. And the reason why surfaces get
12 contaminated is the dust is falling at its
13 terminal settling velocity for five micron
14 AMAV particles which is 0.0075 meters per
15 second.

16 Now one of our recurring problems is
17 that the activity -- and I think you solved
18 the problem at Bethlehem Steel. In other
19 words you abandoned that approach and have
20 come up with an empirical relationship that
21 works. And what we keep seeing over and over
22 again in so many different places that 0.0075
23 deposition rate that's still everywhere. So I
24 guess --

25 **DR. NETON:** Stu's right. That's an

1 overarching issue that was identified at
2 Bethlehem Steel. We dealt with it within
3 Bethlehem Steel, but we committed it might be
4 in the wrong place. It was committed in the
5 Bethlehem Steel closeout that we would go back
6 and look at this issue at other sites. And in
7 fact, we haven't addressed it here. So it's
8 still here.

9 **DR. MAURO:** I think that concludes the
10 concerns that were raised on OTIB-004.

11 **MS. MUNN:** All right, we have action items
12 recorded for it, and I'll get them out to you.

13 Right now it is lunch time. I had
14 hoped to be able to get at least a few words
15 in about all of the OTIBs and any comments
16 that have been made for the PROCs. But as
17 stated before, we have more on our plate than
18 we can possibly handle today. And some of the
19 items that we have listed for the afternoon
20 are really crucial for us to at least touch
21 on.

22 It's my suggestion that at this
23 juncture we stop for lunch, and that we try to
24 follow the rest of the agenda that we've laid
25 out following lunch with the expectation that

1 the next time we meet, we will, in addition to
2 the action items we've listed, attempt to
3 begin where we stopped here which is at the
4 end of OTIB-004, pick up with OTIB-0018 and
5 follow through the matrix from that point at
6 our next meeting. Does anyone have any real
7 grief with that?

8 **MR. HINNEFELD:** It won't compound that too
9 much if we continue to generate responses
10 those document findings we haven't generated
11 responses for.

12 **MS. MUNN:** Au contraire, the more responses
13 that we have the better.

14 Is that okay with everybody?

15 (no audible response)

16 **MS. MUNN:** All right, let's plan on doing
17 that. Those of you who have action items for
18 our period after lunch may want to take a look
19 at them because we do want to try to go there
20 if we can. And we already know that 52 is
21 going to be a long discussion, probably
22 requires more time than what we have here.
23 But we want to make sure it is addressed.
24 It's on everybody's to-do list right now so
25 let's make sure we get to that. We'll talk

1 about global issues first. I don't think
2 there's much to say about the ERs either.

3 **DR. WADE:** TBD-6000, that's on the agenda
4 for next week's call so it would be good so it
5 would be good if we could get a sense of where
6 SC&A is.

7 How long are we breaking for?

8 **MS. MUNN:** We are adjourned for lunch. We
9 will resume at 1:45.

10 **DR. WADE:** So we're going to break the line
11 and at 1:45 or a little bit before we'll be
12 back so dial in then. Thank you.

13 (Whereupon a break for lunch was taken from
14 12:35 p.m. until 1:45 p.m.)

15 **NIOSH REPORT ON GLOBAL ISSUES**

16 **MS. MUNN:** The first item of business that
17 we have following lunch is a NIOSH report on
18 global issues. Jim, I do not, or Stu, who is
19 going to do this.

20 **MR. HINNEFELD:** We're going to tag team
21 this.

22 **DR. NETON:** We're going to tag team.

23 **MS. MUNN:** All right, that's good. I don't
24 even have in front of me a list of what we've
25 identified as global issues that you're

1 currently addressing.

2 **DR. NETON:** Well, that was my question. Do
3 we want to speak to global issues as reflected
4 in procedure reviews or there's an entire list
5 which I'm not, frankly, prepared to talk about
6 today.

7 **MS. MUNN:** Only as is applicable to the
8 charge of this particular working group.

9 **MR. HINNEFELD:** There were three specific
10 topics, residual contamination, ingestion and
11 then the third was internal dose from fission
12 products.

13 **MS. MUNN:** One more time.

14 **MR. HINNEFELD:** Residual contamination, how
15 to reconstruct that, doses from ingestion, and
16 then internal dose reconstruction from fission
17 products intake.

18 **MR. HINNEFELD:** I sent shortly after the
19 telephone meeting I sent to the work group,
20 and I hope I sent a copy of the ORAU TIB, ORAU
21 TIB-0054, which describes internal dosimetry
22 from mixed fission products in the
23 (unintelligible). I sent it without any
24 commentary. And I in the interim have gone
25 through it, and I can briefly describe what

1 the approach describes.

2 The authors essentially ran a computer
3 simulation program that would simulate the
4 burn up and activation of the fuel elements in
5 the fuel and the housing, for lack of a better
6 word, that was wet for exposure in something
7 like four or five or a few designs of
8 reactors. Hanford Reactor was one. FFTF* was
9 another.

10 Anyway, a selection of reactors with
11 the thought that the reactors that were
12 selected and were simulated in this fashion
13 would represent essentially all of the
14 reactors that you would encounter in the DOE
15 system. They all fit into this grouping. The
16 simulation with a code, I believe it was
17 called origin, and it essentially simulates
18 the burn up of the fuel and activation of the
19 other elements in the production of fission
20 products for runs at particular power levels
21 for particular (unintelligible).

22 Having completed that the arrived at
23 inventories of fission products and activation
24 products which as you can imagine are very
25 extensive. And then through a series of

1 assorted screening and evaluation techniques
2 narrowed that number to worry about down to
3 smaller and smaller groupings. The first
4 value you take off, you take off the ones that
5 have essentially inconsequential half life and
6 don't have a radioactive daughter.

7 You don't worry about radioactive
8 daughters. Worry about how much of it was
9 generated. Some of the fission products
10 there's not very much there. And then to,
11 some of them have fairly, I won't say benign,
12 but a fairly low dose. And then finally worry
13 about dose conversion factors to find the
14 handful or so that are dosimetrically
15 significant. And then once you have that
16 handful of radionuclides that you're actually
17 going to analyze, you're going to apportion
18 the total activity that the person took in,
19 you know, as quantified by gross beta or gross
20 gamma bioassay for instance, quantify the
21 total activity and spread among those
22 dosimetrically significant radionuclides.

23 Now in so doing you build in a lot of
24 favorability and no raffinating because you've
25 taken the activity that was really associated

1 with the less dosimetrically significant
2 radionuclides, and you attribute it to the
3 dosimetrically significant ones. So you're
4 building quite a lot of favorability in doing
5 that. And eventually you arrive at an
6 essentially a suite of a handful or
7 radionuclides and a marker radionuclide that
8 you kind of feel it's your one.

9 And you can say, okay, if I've got so
10 much Cesium-137, that means I have 50 percent
11 of that other nuclide and 30 percent of
12 (unintelligible). And then that's how you
13 interpret and ascribe that beta or gamma
14 radioactivity from the bioassay or premiere
15 sampling into a selection of radionuclides for
16 dose reconstruction.

17 Briefly, that's what it does. There's
18 a lot, there are a lot of numbers and table in
19 the TIB, and I think it would take quite a lot
20 of review probably by SC&A or whomever you,
21 whoever's assigned to do it to kind of follow
22 through and interpret. It's not something, I
23 don't think we can talk about it in any
24 meaningful fashion. But if there's, you know,
25 in order to deal with that issue of fission

1 product dose, yeah, dose from fission products
2 since it's on the table, I think that's the
3 way we would have to go. Is to say is this
4 technique, is this a suitable technique.

5 And then further than that this
6 document was prepared after some dose
7 reconstructions were done at Savannah River
8 because the issue originally surfaced in
9 Savannah River dose reconstruction reviews.
10 That's where it originally surfaced. And
11 Savannah River was done before this TIB was
12 prepared, but it's the technique and the
13 thought process is the same. You take a
14 dosimetrically significant radionuclide,
15 ascribe the activity to that radionuclide, and
16 then you have essentially provided at least a
17 favorable aspect of what the intake was.

18 So the whole thing is wrapped up not
19 in a review of OTIB-0054, but also in did
20 those dose reconstructions from Savannah River
21 use a suitable analog or a bounding analog of
22 that approach although not quite as
23 complicated.

24 Did I do it okay?

25 **MS. MUNN:** The attachments certainly appear

1 to be well presented in depth.

2 **MR. HINNEFELD:** The document's like 77 pages
3 long, but almost 50 pages of that are just
4 tables.

5 **DR. MAURO:** Stu, how is it intended, I know
6 we have the OTIB-0018, the 33 that we're
7 talking about. Where does this protocol fit
8 into the grand scheme of coworker?

9 **MR. HINNEFELD:** Well, this would be for
10 bioassay data that was recorded as total beta
11 or gross beta, for instance, or total gamma.
12 And there's even a way, there's apparently at
13 one of the sites, I believe it was at Hanford,
14 there was a certain chemistry that was done on
15 bioassay samples that would eliminate some
16 debate and keep this other suite -- yeah,
17 chemical separation data. And so this even
18 does that, and so if that's the data you have,
19 you use one suite of numbers. If it's a gross
20 beta number, you use a different suite of
21 numbers. And if it's at total alpha number,
22 you use a different suite of numbers. So you
23 have the bioassay measurements which would
24 give you an indication of what was being
25 excreted, which model you use on, you know,

1 which model you use, I think, gets wrapped
2 into which, you know, the select suite.

3 **DR. MAURO:** I know when I was looking at, I
4 didn't review this document. I did get a copy
5 of it. Transportability, I recall when I was
6 looking at issues like that in a different
7 context there certain radionuclides enter
8 primary cooling, for example, of a reactor
9 whether it's light-water reactor had greater
10 propensity to escape. For example, as I
11 recall Cesium-137 moves more rapidly than
12 Strontium-90.

13 So the different radionuclides have,
14 notwithstanding the differences in dose
15 conversion factors and the differences in
16 fission yield quantity after a certain amount
17 of burn-up, there's another dimension which is
18 the degree to which it's likely that that
19 radionuclide is going to escape with the fuel,
20 enter the primary coolant and become airborne
21 through some leakage or by some means. And
22 that's another sort of filter that could have
23 to play here that may not make your approach
24 even more conservative or less conservative.

25 **MR. HINNEFELD:** I believe it is addressed.

1 I only really, frankly just read this this
2 week, and I believe it is addressed in a sort
3 of a release fraction. Whereas, a volatile
4 like iodine or tritium would have a one as a
5 release fraction. Certain elements would have
6 a 0.5 and some might have 0.1 or something
7 like that. I believe it is.

8 **MS. MUNN:** Well, you impressed me by the
9 sagacity shown by including 5.2.2.2. Any time
10 you include the FSTF in your analysis, I find
11 it --

12 **MR. HINNEFELD:** We got some brownie points
13 on that.

14 **MS. MUNN:** Thank you so much. Is this one
15 of the procedures that we have on your list,
16 John?

17 **DR. MAURO:** No.

18 **MR. HINNEFELD:** I don't believe so.

19 **MS. MUNN:** It is not. I'm assuming then in
20 order to fulfill our requirement of this work
21 group it is incumbent upon us to suggest that
22 this be included on the list. Is that the
23 feeling of the other members of this body?

24 **DR. ZIEMER:** This just came out this year.

25 **MR. HINNEFELD:** It's pretty recent. It's

1 pretty recent.

2 **MS. MUNN:** It's brand new, yes.

3 **DR. WADE:** Are we approaching a new year to
4 assign procedures to SC&A?

5 **MS. MUNN:** I believe we are. We've already
6 looked at most of what you're going to be
7 looking at next year.

8 **DR. MAURO:** Yeah, we have delivered all the
9 procedures that we owe you people.

10 **MS. MUNN:** For this year.

11 **DR. MAURO:** This year, and in fact we've
12 even tacked on this TBD-6000 as sort of an
13 add-on because we have the resources to do it.
14 Now this would be like the first of perhaps
15 another set of 30 that might come in the next
16 year.

17 **DR. WADE:** October first is not so far off.

18 **DR. MAURO:** Or we can try to work it in, but
19 I am getting a little concerned that we might
20 be straining the resources of Task Three.
21 Because we were fortunate to have Task Three
22 came in within budget, well within budget,
23 which allowed us to add in the TBD-6000. To
24 add this in also, you know, it's hard to say
25 whether we can handle it.

1 **DR. WADE:** If it's the work group's
2 preference, we could negotiate that. If you
3 can wait until October 1st, we can do that as
4 well.

5 **MS. MUNN:** I wouldn't expect that it would
6 require being done in this fiscal year, but --

7 **MR. HINNEFELD:** In order to work on it
8 though, you have to task them to it even
9 though most of the work would occur next
10 fiscal year.

11 **MS. MUNN:** That's probably the case. Paul,
12 what's your feeling?

13 **DR. ZIEMER:** It seems to me we could, we're
14 close to the starting fiscal year. You're not
15 going to --

16 **MR. HINNEFELD:** Well, the fiscal year starts
17 the day before the next work group meeting.
18 We're meeting on October 2nd. The fiscal year
19 starts October 1st.

20 **MS. MUNN:** That's correct.

21 **MR. HINNEFELD:** So you could make the
22 assignment. You can make the tasking on that
23 day at that meeting.

24 **DR. WADE:** Or we could do it now. I mean, I
25 can handle it contractually. If you tell me

1 you want this to be done next year, then we
2 could have the Board, if you like, react to
3 that on the call next week, and we could be
4 ready to go.

5 **MS. MUNN:** My preference would be to have
6 this group recommend to the Board that this
7 particular, that OTIB-0054, be on the list for
8 the coming fiscal year. Is that --

9 **DR. ZIEMER:** I agree with that. Is this
10 OTIB actually being used now? Or what's its,
11 has it been approved for use?

12 **MR. HINNEFELD:** Yes.

13 **DR. ZIEMER:** Then we need to get it in the
14 list.

15 **DR. WADE:** And it's OTIB-0054.

16 **DR. ZIEMER:** And this is going to be used
17 where you have gross beta bioassay or worked
18 in reactor facilities --

19 **MR. ELLIOTT:** Or worked with fuel.

20 **MR. HINNEFELD:** Right, reactor source terms,
21 right.

22 **MS. MUNN:** Fission and activation product
23 assignment for internal dose-related gross
24 beta and gross gamma analyses. Very good, we
25 will make that recommendation to the Board.

1 **DR. WADE:** We have work group reports next
2 Tuesday, so if you would include that, I will
3 capture it as an action item.

4 **DR. MAKHIJANI:** This is a minor addendum to
5 what John said about status quo this year. We
6 have two reports coming within this whole
7 year. One is the typesetter, and the other
8 one is not yet written, but it will be here
9 before the first of October.

10 **MS. MUNN:** Very good.

11 Next item.

12 **DR. NETON:** The remaining two issues we
13 spoke about the fission product are ingestion
14 and residual contamination. I'll start with
15 the ingestion pathway. We have undertaken a
16 pretty extensive literature search. I think
17 I've briefed the Board on this several
18 meetings ago, but just to summarize where
19 we're at did a literature search to look at
20 all potential pathways where one could ingest
21 material.

22 Specifically we're focusing on the
23 workplace and looked at transfer factors from
24 surface to mouth, peri-oral to mouth, that
25 sort of thing, and developed what I guess I'd

1 call a kind of model, you know, all these
2 pathways connecting together and coming up
3 with distributions on each of those parameters
4 based on the literature search.

5 We haven't finished this. I mean, the
6 research is done. The model's developed.
7 What remains to be done is to edit the
8 document that was written describing how we
9 did this, and then to do some test runs with
10 this model to look, to evaluate how well our
11 current approaches in dose reconstruction
12 model or account for the ingestion pathway.

13 I think we think right now it looks
14 like that we've been fairly generous in doing
15 claimant favorable in our approaches. This
16 model I think will end up validating that. If
17 not, then the model would have to be used to
18 modify the procedures accordingly to account
19 for what was deemed to be ingested in the
20 workplace.

21 It's not done yet though, but the bulk
22 of this is done. It's a draft. We had a
23 contractor helping us work on this. So that
24 needs to be tidied up, edited and the
25 validations run, done before we can finalize

1 it.

2 MS. MUNN: We hope for it by next work group
3 meeting?

4 DR. NETON: In October? Probably not.
5 There's a lot of computing and conflicting
6 things going on right now that would be hard
7 to --

8 MS. MUNN: The work group meeting which
9 probably will occur between October and
10 January.

11 DR. NETON: No, it's months. It wouldn't be
12 October, but after October I think there'll be
13 more time available to finalize this.

14 DR. ZIEMER: Jim, what are you modeling? Is
15 it transfer from hands to --

16 DR. NETON: Surface to hands, hands to
17 mouth, cigarettes to mouth --

18 DR. ZIEMER: -- coffee cups to licking your
19 lips --

20 DR. NETON: -- as much as we could find out
21 --

22 DR. ZIEMER: -- in a contaminated
23 environment, licking your mustache.

24 DR. NETON: It turns out a fair amount of
25 that was available in the industrial hygiene

1 literature which I had. I guess I was always
2 thinking the rad literature is much more full
3 of things like that, but there's been some
4 studies done, specifically in the workplace to
5 the extent where we could develop some
6 distributions about those parameters. But
7 anyway, I can't give you firm date, but it
8 won't be October.

9 **MS. MUNN:** But you'd be more comfortable
10 with saying by the January meeting you'll have
11 an opportunity to have something.

12 **MR. ELLIOTT:** I think we learned from our
13 experience in the TIB-6000 modeling effort,
14 too, test the model. That's the biggest piece
15 here, I think, left to do. Right, Jim?

16 **DR. NETON:** Right.

17 **MR. ELLIOTT:** That takes more time than we
18 anticipate, at least generally anticipate.

19 **DR. MAURO:** I just happened to review the
20 TIB-6000 section dealing with ingestion, and I
21 happened to have hit on one spot that I'm
22 looking at right now. And are you using the
23 RES-RAD 2.4 ten to the minus nine --

24 **DR. NETON:** I think that's what's in there.

25 **DR. MAURO:** -- per meter squared. It's a

1 fraction? Because we're researching that at
2 the same time. So interestingly enough, a lot
3 of the work we're doing on TBD-6000 probably
4 is going to have a lot of applicability here,
5 too. And we'll have that work very soon.
6 We're -- I know we're going to talk about
7 this, but there's --

8 **DR. ZIEMER:** What do you test it against?

9 **DR. NETON:** We're just looking at it against
10 what we can find in the current site profiles
11 just to look to see how --

12 **DR. ZIEMER:** If it would change
13 significantly.

14 **DR. NETON:** Yeah.

15 **DR. ZIEMER:** Are there any real-world
16 datasets that you can test against?

17 **DR. NETON:** I had hoped actually this was my
18 --

19 **DR. ZIEMER:** I mean, where do the transfer
20 numbers come from?

21 **DR. NETON:** There are some field
22 measurements out there. For example, in the
23 early fall-out days people were working on a
24 contaminated aircraft. And they actually did
25 some measurements item by air-type

1 measurements. Those sort of things. There's
2 some Oak Ridge studies about transfer to
3 cigarette, people smoking on break, that kind
4 of stuff. We gleaned as much as we could from
5 the literature on that.

6 What I hoped to do, which didn't pan
7 out, my thought was that a lot of uranium --
8 and by the way, this was mostly relevant to
9 uranium because it's where the AWE's where we
10 don't have bioassay data. If you have
11 bioassay data, this is not an issue. Where
12 you don't have bioassay data at the uranium
13 facilities, I thought that we could take a
14 place like Fernald, for example, and just look
15 at what's not being screened in the urine of
16 these workers.

17 People who weren't exposed and working
18 day-in/day-out in the plant, and one could put
19 an upper limit on the amount that is ingested
20 based on that. You would assume a certain
21 amount would come out in the urine if they
22 were ingesting. And at one time SC&A and
23 NIOSH were debating whether it's 100
24 milligrams a day.

25 I always thought that was high, and I

1 thought, well, surely if you ingested 100
2 milligrams of uranium per day it would come
3 out in the urine of the workers who were
4 monitored routinely. Well, that didn't work
5 out for a number of reasons, you know, the
6 solubility issues and those sort things,
7 missed dose. It just was not a practical
8 approach. I thought we were going to have
9 this great publication on that, but it just
10 didn't work out. So we ended up going with
11 sort of the (unintelligible).

12 **DR. MAURO:** The EPA did a lot, you know, the
13 EPA has their 50 milligrams per day number,
14 and I remember reading that literature. A
15 fellow named Calibresi* that did a lot of
16 work. What he did was he measured, I think it
17 was how much silicone is in the feces of
18 people that were working in gardens. In other
19 words, know much milligrams per gram of dirt
20 of silicone is in the dirt. And the only way
21 you're going to get silicone coming out the
22 other end is because you ate some of the dirt.

23 **DR. NETON:** Now, I disagree with that. I
24 think that study is flawed because they didn't
25 account for the amount that was ingested and

1 subsequently swallowed. So he's got both
2 pathways he's measuring --

3 **DR. MAURO:** So the breathing it in is
4 swallowing, too.

5 **DR. NETON:** Yeah, I think there's a flaw in
6 that study. But anyway, this is where we're
7 at.

8 The residual contamination we're not
9 nearly as far along as this. We developed, as
10 John talked about earlier, a model for
11 Bethlehem Steel where we actually took
12 residual contamination, inhalation of material
13 that's suspended from residual contamination
14 that we're talking about here.

15 At Bethlehem Steel we actually took
16 some air sample data, silicone data. But at
17 Simonds Saw & Steel where the plant was, where
18 they were not rolling any uranium, just had
19 air sample data which presumably would be
20 anything in the air at that point would be a
21 result of people just walking around, doing
22 their normal path without blowing uranium into
23 the air from rolling it. We developed some
24 pretty good ratios there we thought that we
25 could apply to places like Bethlehem Steel.

1 SC&A's comment on that was that looked
2 okay. It was probably applicable to a
3 Bethlehem Steel. It would transfer down to
4 that type of facility, but they weren't
5 convinced that it was generically applicable
6 at all these different sites. So we're in the
7 process of looking for more data to support
8 this, and if need be, modify the values to
9 account for different operations, that sort of
10 thing.

11 The data are fairly sparse. It's very
12 rare where you have data where it's really not
13 in operation. They're taking air samples to
14 document the resuspension factors. We are
15 working on this, but we're not as far along as
16 we were with the ingestion model.

17 **DR. ZIEMER:** Well, the issue of room
18 clearance was discussed this morning as one
19 percent per day. Does that arise in this
20 context, too? Are you looking at settling out
21 or those kind of factors or is this just
22 resuspension?

23 **DR. NETON:** This is resuspension material
24 that is I can pretty much assume once they
25 shut down operations we knew that the air

1 clears pretty quickly at uranium facilities.
2 So what you're left with is a blanket of
3 uranium.

4 There's two issues. One is how much
5 is re-suspended from what was deposited and
6 how much is actually removed from the plant
7 over time due to just cleaning operations and
8 such. And that's the more difficult of the
9 two, yeah, the dilution factor.

10 **DR. ZIEMER:** Particle distribution of a re-
11 suspended material might not be the same as
12 the original, but the heavy stuff come back up
13 into the breathable air?

14 **DR. NETON:** That's a good question. I don't
15 really know. We believed it was empirical.
16 We took air sample data that was generated at
17 Simonds Saw and Steel. But you're right --

18 **DR. ZIEMER:** Well, if the air sample data's
19 got the full spectrum of heavy stuff down, I
20 would think re-suspended, intuitively, I'm
21 feeling like it ought to be a much smaller
22 aerodynamic particle size.

23 **DR. NETON:** That's a good point. We did
24 take the air that was re-suspended. We
25 presume it's re-suspended because the plant

1 operations have been shut down for some time
2 yet they were still continuing to monitor the
3 air in the plant. So we had pretty good
4 confidence that this was just based on
5 resuspension plant activity. But you do raise
6 a very good point is that is the re-suspended
7 aerosol a finer aerosol.

8 **DR. ZIEMER:** Yeah, and therefore likely to
9 get to the deep lung or something.

10 **DR. NETON:** This is probably one of the
11 difficulties. It's not easy to come up with
12 some concrete numbers.

13 **DR. MAURO:** Has (unintelligible) literature
14 health.

15 **DR. NETON:** Yeah, we've looked at that sort
16 of stuff, too. You have used a Bethlehem
17 model at some point.

18 **DR. MAURO:** Yeah, we did.

19 **DR. NETON:** I can't recall the mechanics of
20 that model now, but it was a pretty
21 complicated model.

22 **MS. MUNN:** But all three items are working
23 in progress. No timeline possible for any of
24 them right now.

25 **DR. WADE:** Or we're going to hear by

1 January.

2 MR. ELLIOTT: We'll come back to where we're
3 at status-wise --

4 MS. MUNN: Thank you.

5 MR. ELLIOTT: -- but can't predict today.

6 MS. MUNN: Anyone else have any comment on
7 global issues before we move on to PERs?

8 (no response)

9 PERs

10 MS. MUNN: Apparently not. Who's going to
11 tell us where we are with P-E-Rs?

12 MR. HINNEFELD: I guess I am. I think the
13 context here was the discussion is this topic
14 or another set of documents or procedures for
15 the work group to concern themselves with.
16 Just done a little bit of evolution in the PER
17 process because of our conversation with the
18 Department of Labor. And if a PER was as
19 envisioned, it would allow us that when we
20 adopt a change in dose reconstruction
21 techniques, it would allow us to consider the
22 universe of claims that may have been
23 completed using the old, no longer used, and
24 to provide to the Department of Labor a
25 listing of that population.

1 Here are the ones that could
2 potentially change outcome because of this
3 dose reconstruction. And the idea was that
4 the Department of Labor would be sending a
5 bunch of letters to people whose cases were
6 closed and tell them that it was going to be
7 reopened just to have another denial come
8 back.

9 Well, we've not been very effective at
10 getting these turned out and over to the
11 Department of Labor. And they feel like they
12 have a lot of liability with changed
13 techniques out there with dose reconstructions
14 from old techniques that the dose
15 reconstructors go out there and do what has to
16 be done. They are pretty assertively now
17 returning those cases to us for rework. So we
18 have a larger population of reworked dose
19 reconstructions to do.

20 So there is still a little bit of work
21 that we do get to do up front, to do that
22 screening and winnowing of that approach, of
23 the numbers. Dave Allen's the guy who's in
24 the middle of that. And so there is still a
25 certain few things you can do. For instance,

1 if the change is the maximum of four rem a
2 year, it's the highest increased dose you
3 could get out of the change.

4 And you take a dose reconstruction if
5 you give this person four rem a year extra to
6 their target organ, and they still don't look
7 compensable, then I think they probably will
8 go along this, okay, this one can drop out and
9 doesn't have to be reworked. So there's very,
10 there's a far more limited kind of screening
11 we'll be able to do today.

12 So with respect to a PER and whether
13 it's good fodder for the working group, what
14 it would look like would be, what the document
15 would look like would be, it would a
16 description of here's the dose reconstruction
17 technique change that we're evaluating, Super-
18 S plutonium.

19 Based on this, you know, and here are,
20 we might say this is the maximum change it can
21 make to a non-respiratory organ. And based on
22 that anybody with a non-respiratory organ
23 cancer whose probability of causation was
24 below, what, 20 percent or something because
25 maximum change could only bring them up to 45

1 percent, and doesn't need to be done. I mean,
2 there may be some analysis like that.

3 **MR. ELLIOTT:** I have to say something at
4 this point. The charge of this working group
5 to look at procedures and I think is fully
6 appropriate to applied to PERs. However, I
7 would ask that you treat this as you do in the
8 subcommittee and Board's review of completed
9 dose reconstructions.

10 By that I mean that you would need to
11 examine a completed PER, not pick up a PER in
12 progress where we're -- like Super S the
13 example Stu just gave you, where we are
14 working through about 3,400 claims right now.
15 We need to get through those 3,400 claims and
16 say that we're done. And then I think it's
17 your ample opportunity to examine how we
18 performed our work under a PER.

19 I don't know if Emily will chime in
20 here or not, but I think these claims are
21 still in, even though they've had, in some
22 cases, a recommended decision, in other cases
23 a final decision, once they're remanded back
24 to us for rework, then they're still in the
25 adjudication process. And we need to treat

these as a non-adjudicated claim until the PER is completed.

And so right now I think we've only got maybe two, maybe three PERs we could point you to. The other thing to consider here is that right now as we're, with the advent of all of the PERs that we're working on, we're examining the claims against changes other, that were made that might affect the claim besides just the PER that is facing the claim.

So there's that going on. Very complicated process right now for us and those that support us. So that would be my commentary that I needed to leave you with.

MS. MUNN: The interpretation of the Chair of this group that we really cannot look at PERs in any depth until they have, in fact --

MR. ELLIOTT: Until we show that the last claim has been examined against the PERs.

MS. MUNN: They're done. I think it's incumbent upon us as a work group to maintain some sense of where we are with the, and how pervasive they become. But aside from that, that's the only expectation that I have. Does anyone else in the work group have other

1 expectations of this?

2 **MR. ELLIOTT:** We certainly would commit to
3 get back to you as soon as, with a list of
4 completed PERs, we'll add to that as we
5 complete them.

6 **MS. MUNN:** That I think is precisely what we
7 need to look at in this group until we reach a
8 point where there's something other to be done
9 than that.

10 **MR. ELLIOTT:** I'd like for the working group
11 and the Board to understand that there's
12 different, in these claims that have had a
13 decision there's a unique category that Stu
14 referred to earlier that DOL feels they have a
15 strong liability with, and that is the
16 category where there's a recommended decision,
17 and there's a timeframe of, I think it's one
18 year, that they have to come to closure, to a
19 final decision. And so in our priority of
20 work under PER, that category is given a
21 higher priority. We're working those first
22 within each PER.

23 **MS. MUNN:** Very good.

24 **MR. ELLIOTT:** I'm sorry. Did you have
25 something you wanted to --

1 **DR. NETON:** I was just going to say they've
2 actually become very much less interesting
3 based on our new approach because we are
4 requesting most of them back for rework. Part
5 of that reason is because DOL requires some
6 pretty good stringent standards to be placed
7 on our proof that they weren't affected.

8 And what's happened is we've had a
9 number of simultaneous changes to the point
10 where we can't have, isolate one change at a
11 time anymore. There might be one change you
12 could say won't affect it, but there may be
13 six other changes that affect the same one.
14 So for instance with the Super S, I think we
15 just asked for 4,000 cases back for complete
16 rework.

17 We're just going to work them from
18 square one and apply every change, treat them
19 like the novo dose reconstructions.
20 Everything we've done today will be done
21 against that case. So the ones that we screen
22 out are the very simple screening tools like
23 there was no plutonium at that facility.
24 There could have been Super S. Those are the
25 kind of simple screening tools we apply now.

1 There aren't these elaborate tools to try to
2 figure out change to two percent or --

3 **MR. ELLIOTT:** We can certainly look on our
4 website and see the PERs that are presented
5 there. And there are different screening
6 mechanisms outlined in each. And of course
7 the first screen is was the claim completed
8 before the change was instituted. And if it
9 was completed after that, then we don't have
10 to look at it because the change was applied
11 to it. But as Jim says there are other levels
12 of screens that can be applied beyond that.

13 **DR. WADE:** At some point when a change or a
14 series of changes results in a series of
15 reworks of dose reconstructions, will that be
16 reported in some document? Will that be a
17 PER?

18 **DR. NETON:** The reworks themselves won't be
19 because they'll be treated as the novo dose
20 reconstructions and sent -- novo's not the
21 right word -- but complete reworks, and
22 they'll be sent through, the claimants
23 notified, claimant gets another close-out
24 interview. That whole process takes place.

25 **MR. ELLIOTT:** But I think to answer, to your

1 point though in your question, Lew, we need to
2 be ready to identify when we've analyzed that
3 last claim under that particular PER for the
4 purposes of the working group.

5 **DR. WADE:** What form would that take? Is
6 this will be a newly generated document that
7 you would prepare that would list the dose
8 reconstructions and make them available? Or
9 how would --

10 **DR. NETON:** Well, the PER itself would
11 identify, for instance in the case of Super-S
12 that there were 7,000 cases potentially
13 affected by Super-S. And then we'll say that
14 there were 4,000 that we believe Super-S
15 really had the potential to exist then we need
16 to send those cases back for dose
17 reconstruction.

18 **DR. WADE:** Would it go beyond to say of
19 those 4,000 the decision was changed and there
20 is --

21 **MR. ELLIOTT:** Well, we are interested
22 ourselves in how many cases flip. And DOL's
23 also interested in knowing how they flip
24 either way. We're more interested in making
25 sure that we don't miss one that flips from

1 non-compensable to compensable. But they want
2 to know how many went the other way, too.

3 So I think we're going to have to
4 provide some level of reporting about that.
5 And right now there are a few completed PERs
6 that have that information in them, but you'll
7 see a majority of our PERs don't have that
8 because we haven't finished it. We need to
9 come forward with some kind of reporting
10 mechanism.

11 **DR. WADE:** Once it's finished then it's very
12 interesting for this work group to look at
13 that and decide what it wants to do with it.
14 It is business that we're doing now that the
15 Board needs to have the ability to review.

16 **DR. NETON:** I don't disagree. I guess the
17 problem is though when you have multiple
18 changes affecting multiple dose
19 reconstructions, it's hard to identify which
20 change was the one that might have flipped it.
21 I think reporting raw numbers as to how many
22 were changed, that's not --

23 **DR. WADE:** The work group will have to
24 struggle with that.

25 **MR. ELLIOTT:** Well, we will have a tracking

1 system that we're working on, too. And that
2 might be the vehicle to aid the working group
3 with.

4 **DR. NETON:** The other, just to close it out,
5 is just because we asked for it back from the
6 Department of Labor doesn't necessarily mean
7 we'll get it. There may be other things like
8 SEC, certain cases have got to SEC or the case
9 has no eligible survivor. I mean, there's a
10 number of issues that we don't control. We'll
11 tell them that these cases need to be
12 reworked. It's up to them to send them back
13 to us for rework. But a good percentage of
14 those, so for instance at Rocky Flats have
15 gone SEC. We're not going to see them.

16 **DR. WADE:** This is a great positive
17 evolution from my point of view, and I think
18 it's important that in some way if the
19 collected together and the Board had the
20 opportunity to look at it if it wishes.

21 Larry, when you said you'd provide a
22 list of completed PERs to the work group, when
23 would you first do that?

24 **MR. ELLIOTT:** Oh, I think at the next work
25 group meeting we can give you a list of those

1 that have been completed. We can give you
2 another list of those that are underway. That
3 should be straightforward.

4 **MS. MUNN:** That's really all we need in my
5 view at this juncture.

6 Anyone else have anything to say about
7 PERs?

8 **MR. ELLIOTT:** It would be the PERs
9 themselves, and then if the Board wants a list
10 of the claims under a PER that's been
11 completed, we could provide that.

12 **MR. SHARFI:** Some of the ones that were put
13 in the previous PERs are now in the new PERs.

14 **MR. ELLIOTT:** Yes, they are.

15 **MR. SHARFI:** That claim back up?

16 **MR. ELLIOTT:** Right, we'll have to. That's
17 why I say this not straightforward. It is
18 going to be very complicated for us to --

19 **MS. MUNN:** We have another living document.

20 **DR. WADE:** Well, with any document though
21 that goes to the value added by review and the
22 fact that there is a commitment to serve the
23 claimants in this program.

24 **MR. ELLIOTT:** And there's an end point here,
25 too. It's not like, you know, we have a bulk

1 of these that we're faced with right now and
2 once we work through those, yes, we'll still
3 have PERs in our future but not the volume,
4 not the magnitude --

5 MS. MUNN: Not like this.

6 MR. ELLIOTT: That's right.

7 MS. MUNN: We appreciate that. We'll look
8 forward to seeing the list at our next
9 meeting.

**DISCUSSION OF OTIB-0052 AND SC&A REVIEW "PARAMETERS
TO CONSIDER WHEN PROCESSING CLAIMS FOR CONSTRUCTION
TRADE WORKERS"**

10 And now, everyone take a deep breath.
11 OTIB-0052, parameters to consider when
12 processing claims for construction trade
13 workers. Who wants to lead off here? Have we
14 even discussed this?

15 DR. NETON: I would think SC&A would present
16 their findings of their evaluation.

17 MS. MUNN: I would like to hear that, and I
18 believe SC&A is prepared to do that. John?

19 DR. MAURO: This is Steve Marschke who is
20 the author of the document along with Arjun.
21 Steve, if you want to kick us off?

22 MR. MARSCHKE: Yeah, I was given the task to
23 review TIB-0052, and we in somewhat more
24 detail than what we usually perform our

1 reviews of the procedures and the other
2 documents. And the end result was the Task
3 Three Supplement Four report that you all were
4 given. I guess it was issued back in July.

5 Generally, I think we like what we saw
6 in OTIB-0052. Most of our comments that we
7 made are, I think are geared towards making a
8 stronger document. Making it more
9 bulletproof, if you will. But in overall I
10 think the, well, the approach that we kind of
11 took was kind of a two-pronged approach. One
12 was we did try to look at the analysis that
13 was done and duplicate the analysis that was
14 done by using the data files that were made
15 available to us on the O drive.

16 And then we also took it a step
17 further, and we ran some sample cases. And a
18 number of sample cases to Jim Neton mentioned
19 this morning when we were talking about TIB-
20 0020, the proof is in the pudding. And so we
21 tried to show what would happen if we had
22 some, if we treated some construction workers
23 who had monitoring data as if they did not
24 have monitoring data.

25 And we applied the OTIB-0052

1 methodology to these construction workers and
2 compared those results to their actual
3 monitoring data just to get a feel for how
4 conservative the OTIB-0052 or is the OTIB-0052
5 methodology conservative. Generally, we found
6 out when we did that, we did that mostly at
7 three sites: Savannah River, Rocky Flats and
8 Hanford.

9 And generally when we did that, we
10 found that the OTIB-0052 methodology was
11 conservative. When we took a ratio of the
12 OTIB-0052 methodology divided by the measured
13 dose doses. And these are integrated over the
14 working life of the individuals that we looked
15 at, the sample workers that we looked at.
16 Generally, we found a ratio greater than one
17 implying that the OTIB-0052 methodology was,
18 in fact, conservative.

19 There were a few outliers and a few
20 exceptions. The other thing that we did look
21 at was or one of the questions that came up
22 was do different construction occupations
23 have, you know, higher exposures than other
24 occupations. And this was really not
25 addressed in OTIB-0052, but we tried to look

1 at that somewhat.

2 And we found that, yes, there is a
3 range or seems to be a range by occupation
4 with people like pipefitters, boilermakers and
5 so and so forth, they receive doses which are
6 higher than, generally higher than the
7 construction worker average. Teamsters,
8 electricians and painters, they seem to
9 receive doses which are lower than the
10 construction average.

11 So when we took our samples to test
12 the OTIB-0052, we kind of tried to select our
13 individuals. It wasn't quite a random test.
14 We tried to bias our individuals from those
15 occupations that received the higher doses
16 like pipefitters. If you look at the Savannah
17 River, you'll see we have, out of the 20
18 workers that we sampled, we have ten
19 pipefitters. And even in that case we found
20 that the OTIB-0052 methodology generally was
21 conservative. Generally overall, we are happy
22 with it. Now the -- at least I'm happy with
23 it. I don't want to speak for everybody.

24 But there were some concerns. I mean,
25 one of the reasons why the OTIB-0052

1 methodology is conservative is because we are
2 integrating over the working life of the
3 individual. So if you had an individual in
4 there who basically was only there one year or
5 a very short period of time, there is the
6 distinct possibility when you look at some of
7 the graphs that are actually in OTIB-0052, you
8 can see that the construction workers' doses
9 are much higher than the 1.4 multiplier.

10 So the OTIB-0052 methodology over a
11 short duration may not be conservative. And
12 we kind of, I mean, how do you address that?
13 I'm not sure how to address that.

14 **DR. MAKHIJANI:** Can I just interject that
15 the short period of time would generally be
16 less than three-to-five years.

17 **MR. MARSCHKE:** Yes.

18 **DR. MAKHIJANI:** And the sort of long period
19 of time that we examined was like ten years.
20 So it would be ten years or more.

21 **MR. MARSCHKE:** That's a good way to capture
22 it.

23 **DR. MAKHIJANI:** Just to put some numbers on
24 where these uncertainties are, and where it
25 didn't appear to be a significant issue.

1 **MR. MARSCHKE:** The other thing I, later I
2 got from reading OTIB-0052, again, it's kind
3 of like OTIB-0020 that we talked about this
4 morning. It's more of a guide for the
5 writers, the site experts when they are
6 developing their coworker models and their
7 coworker OTIBs. They put a table in the
8 coworker OTIB which is for construction
9 workers, and I get the impression from that
10 and from looking at OTIB-0052 itself that this
11 guide is more for those people than it is for
12 the dose reconstructors.

13 And so we do have some concern if you
14 have dose reconstructor who happens to get a,
15 be trying to reconstruct a dose to, for
16 example, a pipefitter whose only been there
17 for three years, a short period of time, then
18 this methodology may not be favorable under
19 certain sets of assumptions that could be
20 populated. And so again, I'm not sure how to
21 ensure claimant favorability on a individual
22 claimant's claimant basis.

23 Overall, you know, if you looked at
24 the whole population of claimants,
25 construction workers, I think OTIB-0052 is

1 favorable. You know, if you look at it
2 percentage wise it's probably in the 95
3 percentage or definitely greater than 90,
4 probably 95 percent of the time it's a
5 claimant favorable one.

6 The question is there are certain, you
7 know, that leaves five percent of the
8 claimants out there who basically how do you
9 get claimant favorability for those
10 individuals? And I'm not sure how that can
11 be, you know, is incorporated into OTIB-0052.

12 **MS. MUNN:** I had a question with respect to
13 the specific items on the matrix. I don't
14 know whether NIOSH has had an opportunity to
15 look at that matrix and to address those
16 questions or not, but I have not heard any
17 rumblings that there are responses to any of
18 those.

19 **MR. CHEW:** They've been out already.

20 **DR. NETON:** Yeah, we sent them out.

21 **MR. CHEW:** Yeah, we sent the responses to
22 everyone.

23 **DR. NETON:** When did they go out? Monday?

24 Probably while you were traveling.

25 **MS. MUNN:** While I was in the air.

1 **DR. WADE:** There's a thought, too.

2 **MS. MUNN:** Thank you.

3 **DR. NETON:** We did have an opportunity to
4 (unintelligible) some reaction to these
5 things. Mel Chew --

6 **MR. CHEW:** Do you want me to grab a copy?

7 **DR. NETON:** We're prepared to go over them
8 individually.

9 **MS. MUNN:** Does everyone want copies?

10 **DR. NETON:** This document came out in July
11 sometime so we've had a short time period to
12 address a hundred-page document. But we were
13 somewhat gratified to see that we aren't that
14 far apart really.

15 **MS. MUNN:** I was pleased to see the matrix
16 wasn't any larger than it was.

17 **DR. NETON:** It was 37 pages.

18 **DR. MAKHIJANI:** May I add a couple of
19 criticism just to supplement Steve's summary
20 there. That there is a, well, it will come up
21 in the matrix, there's an item, well, a number
22 of items one about neutrons, for instance, has
23 a gap in that regard. It didn't cover
24 neutrons. And so maybe we can just pick that
25 up.

1 **MS. MUNN:** Yeah, as we move down it.

2 If NIOSH is ready to address those
3 matrix items, I would be very pleased to hear
4 that now. We'll have hard copies. You can go
5 ahead. We don't have to wait for the hard
6 copies. Whoever's going to do that.

7 **DR. NETON:** We're going to rely on Mel to do
8 the heavy lifting with encouragement from me.

9 **MR. CHEW:** We can do a couple things. As
10 you see, we did respond to the matrix.

11 And Steve, thank you very much for
12 your comment about the overall -- I'd like to
13 reinforce what Steve said -- for as you said,
14 pretty much 95 percent of the cases here at
15 the 95th percentile, the correct adjustment
16 factor was. This is really, we need to focus
17 what we're trying to do.

18 This is for the unmonitored
19 construction worker, unmonitored construction
20 worker and not to be confused with the person
21 who was monitored. And so where do we get
22 unmonitored construction workers and all of
23 their missing data that's possibly from their
24 data. And did they happen to have basically
25 on their claim that you can show that they

1 should have been monitored. So we need to
2 make sure we're focusing on the unmonitored
3 workers.

4 I think we're very fortunate and just
5 give a little background. This was quite an
6 interesting assignment for the team that we
7 put together. We had to go to observe and get
8 some data across the complex that was
9 representative. Certainly, we went to the
10 site as number one, certainly, where we can
11 now separate information that we can identify
12 construction workers versus the all monitored
13 workers.

14 Remember clearly what we're trying to
15 do is to say are there circumstances where
16 there are construction worker who was
17 unmonitored and we had to go to a coworker
18 study that the coworker study was not
19 necessarily claimant favorable to that
20 unmonitored construction worker. So that's
21 what really the basis of involving the
22 adjustment factor.

23 I could go on, and we could go right
24 down the matrix one item at a time, but we
25 want to maybe for the sake of saving some

1 time, I would like to address the issue that
2 we brought up directly about the example of
3 the pipefitters and things like this where we
4 think we have applied the proper adjustment.

5 **MS. MUNN:** My preference would be that you
6 address the question that's been put on the
7 table and questions that are out there. And
8 then if there are other remaining significant
9 items from the matrix that we look at those
10 afterwards. If any of the matrix items are
11 not of significant importance that it would
12 make differences that we should be concerned
13 about with respect to dose reconstruction,
14 then those are issues which we can easily, I
15 would think, resolve offline. What we want to
16 look at is what is significant. What's been
17 brought to us as being significant. Let's do
18 that first.

19 **MR. CHEW:** I'm not sure everybody has a
20 copy. This is directly comes out of the table
21 that you people put in the response, and it's
22 in the SC&A report.

23 I'd like to make a very quick comment.
24 When we, this was not a simple data gathering
25 exercise in just putting information on a

1 spreadsheet and come up with certain
2 percentages, right:. We went to specifically
3 the site to clearly look at when we saw
4 exposures, and we clearly explained by either
5 operationally or reasons why exposures were
6 high for a particular year. What things that
7 happened at that particular site. What
8 operational things happened at that site that
9 cause, for example, certain categories that
10 people could get more exposure.

11 And the one that is in your report
12 that is in pretty color -- and unfortunately,
13 we didn't print this out in color. It would
14 probably be easier to see -- is a very good
15 one. This is Savannah River. Fortunately,
16 Savannah River had kept very good records of
17 exposures to their categories of construction
18 workers broken down by construction worker.
19 And that's even better than we even expected.
20 You know, we can pick out electricians. You
21 can pick out pipefitters. You can pick out
22 millwrights. You can pick out carpenters and
23 painters.

24 I'd like to make another comment.
25 Like the pipefitters and electricians by about

1 a factor of four or five times more at
2 Savannah River than almost all of the other
3 categories. And then there's a little
4 anecdotal story that I've been share a little
5 bit here if you don't mind.

6 We were wondering why there, because
7 we understand the pipefitters to be a large
8 number because as you well know if you've been
9 down to Savannah River, especially the canyon,
10 it's really a plumber's nightmare. Everybody
11 can relate to that one there with plumbers.
12 And then certainly some of the cement
13 finishers have high exposure, too, because
14 they have to make the chases so they could put
15 the plumbers in.

16 Well, we often wondered why there was
17 about equal number of electricians as there
18 were pipefitters which is certainly an
19 anecdotal story, and I appreciate the time to
20 tell it. It appeared that in the early years
21 one member of the DuPont family owned an
22 electrical company. And so the electricians
23 were of the higher paid category, billing
24 category there.

25 And so you can just relate to your own

1 thoughts in telling you why there were more
2 electricians than anyone else because we did
3 go down to talk to some of the workers
4 directly so we can relate to exactly what
5 happened at Savannah River. And they said,
6 oh, yes, there was a lot of electricians and
7 some of them were not necessarily always doing
8 electrical work.

9 I'll leave it there with that one. I
10 think we can all smile at that recognizing
11 that DuPont operated Savannah River for a
12 dollar a year. I think we need to understand
13 that.

14 If you don't mind looking at the graph
15 that I just showed you, probably the key one
16 that rightly point out, Steve, there are some,
17 a few years, that the some specific categories
18 of worker would have been hired in the 1.4
19 multiplier that we suggested. And so if you
20 look at the date here, it happened in about
21 the late 1960s and again in about the mid-
22 1970s were example pipefitters got a
23 significantly higher exposures than what you
24 considered the all monitored worker.

25 I think Jim and I were discussing

1 that. Remember, this is an important piece of
2 information for the very fact that these
3 people were monitored. And how do we know
4 that they were monitored? Well, going back to
5 look at that particular timeframe, there were
6 two canyons, the F Canyon, which people call
7 F, and H Canyon, was going through some fairly
8 major modifications and to the improve the
9 particular processes.

10 And so pipefitters were brought in for
11 those particular periods. This is under, the
12 canyons were classified area, Q cleared area
13 and a badge. So we need to examine ourselves
14 in saying, well, is it reasonable to say that
15 we're going to have an unmonitored worker that
16 if we multiply his, we're taking all monitored
17 worker exposure, multiply that times 1.4, do
18 you think that's a reasonable, that that
19 really happened? That he would receive a
20 significant exposure that he wouldn't be
21 monitored.

22 And I think that's a judgment for this
23 discussion here, but I think it's a plausible
24 reason for saying, okay, yes, I can multiply
25 that. I did a very quick job. I did a

1 calculation here. We looked at the high peak
2 of a pipefitter versus the all monitored
3 worker, the multiplier was 1.8 for that one
4 year, for that one year. One point two for
5 the high peak and another one down the lower,
6 the multiplier to be 1.5.

7 Is it plausible -- and, Arjun, you
8 mentioned could there possibly a third period
9 of time for that person that were only working
10 for those few years. Probably so because they
11 brought in a lot of people. You know, they
12 didn't work any place else. But again, is it
13 plausible to say that person wouldn't be
14 monitored. And this is the 95th percentile.
15 And we would multiply an all monitored worker
16 dose which includes, which includes the
17 construction worker dose multiplied times 4,
18 would we be adequately claimant favorable for
19 that particular claim?

20 And I think that's probably a
21 discussion that I'd like Steve to talk about
22 the particular categories of people. And the
23 Savannah River data is a very, very good one
24 because it has the ability to separate out.
25 Now, in add to that do we look at some of the

1 other facilities to see the same thing
2 happening here? Wherever we had, especially
3 Oak Ridge National Lab, we went through some,
4 working with some of their reactors when they
5 did some modifications. I think you know
6 about those, John. Hanford, you know, when
7 some of the separation processes. The Chem
8 Plant in Idaho is a very good one.

9 So all along the way when we're
10 looking at exposures, we just didn't take the
11 all monitored worker. Wherever we were able
12 to separate, and in many place we were able to
13 separate each of the different types of
14 construction workers. We were trying to make
15 sure that some particular group would not
16 stick out consistently that would now
17 invalidate the issue about is the multiplier
18 valid across this exposure record. So I want
19 to let him comment on what I just said. I'll
20 stop everything.

21 **MR. MARSCHKE:** My comment would be I didn't
22 find that information in the OTIB. And if
23 that information could be, you know, if I'm
24 correct, and it's not currently in the OTIB,
25 that information I think would be very

1 enlightening to put, you know, because it
2 seems like you're selling yourself a little
3 short here in the OTIB with all the thought
4 processes behind your selection and so on and
5 so forth. And that's why when I say making it
6 harder, making the OTIB more bulletproof, I
7 think that's, a lot of our comments are geared
8 towards that aspect of it.

9 **MR. CHEW:** I would make a comment. Jim and
10 I were at the meeting when we first met with
11 the Council for Protection of Worker Rights.
12 At that time I was able to have only at that
13 time, only at that time, to have particularly
14 the Savannah River information. I think Jim
15 will recall I was able to separate out five
16 different categories of workers compared to
17 the all monitored worker. And I even had
18 that, I brought my slides that I used, and I
19 can show that to, I'll just turn it around. I
20 know you folks cannot see that, but this is by
21 construction worker only.

22 What this shows, the graph shows
23 interestingly by certain years, certain
24 construction workers clearly got higher. A
25 labor category had much higher exposure. This

1 is just compared to each other. So it was not
2 always consistent that pipefitters were always
3 the highest.

4 **MR. MARSCHKE:** No.

5 **MR. CHEW:** You knew that, too. So I think
6 if you really looked at the overall effect of
7 the multiplier that will be applied to the
8 unmonitored worker for all year, for all year,
9 you're going to be pretty well convinced that
10 you are pretty much with the claimant
11 favorable.

12 Arjun, this is the slide I used in the
13 Council for Protection of Worker. I did not
14 make a copy.

15 **DR. MAKHIJANI:** I think you can e-mail it if
16 you have. I was going to say, Mel, you made a
17 very cogent argument. I haven't seen
18 information, but we have somebody from CPWR
19 here who would be useful for us to hear his
20 reaction to what you've just said.

21 **MR. CHEW:** Are you talking to Mr. McGowan?

22 **DR. MAKHIJANI:** Yes.

23 **MR. MCGOWAN:** I'm much better at
24 interviewing workers and doing exposure
25 assessments than I am in all this mathematics

1 that most of you folks enjoy. I do know that
2 there are a number of instances in which
3 construction workers had security badges
4 issued, but they were not radiation monitoring
5 badges. So I think you have to be somewhat
6 clear in your analyses of information is what
7 kind of badge you're actually talking about
8 and did that person actually have a radiation
9 badge.

10 Also, in many instances, not
11 necessarily at Savannah River, where
12 individuals, construction workers, were
13 pulled. They had to take their badge off
14 before doing certain things or they would be
15 laid off. You either take your badge off and
16 go and do this task or you're laid off, and
17 you're not coming back. So people were
18 working under circumstances that would have
19 given them a very high exposure but could
20 never be recorded. So those are the kinds of
21 things you see when you talk to the actual
22 worker and that may be off what we're talking
23 here, but that's the kind of thing that you
24 see.

25 **MR. CHEW:** Would you, in our interviews

1 occasionally we would hear some kind of
2 anecdotal referencing about asking to remove
3 badges. There's been no clear evidence that
4 this was a consistent habit or even anything
5 that we would know how to work with. I'd like
6 to mention that we weren't short of data.

7 I think Jim knows that I delayed as
8 much as I can because we had a team out there
9 trying to gather as much data at that time.
10 And many of the coworker studies hadn't been
11 done even or since, so in order to do OTIB-
12 0052 we basically went out and derived the
13 data. Surprisingly enough, I think you saw
14 from the OTIB itself, we have just external
15 for all monitored workers over a million data
16 points, and for construction workers we have
17 216,000 which represents 20 percent. And
18 that's probably not unreasonable thinking
19 about the amount of construction worker versus
20 other workers.

21 And also similar kind of numbers for
22 internal exposures, too. That was probably
23 the hardest thing to get. The Oak Ridge
24 complex because of the work that was done with
25 Donna Cragle and the studies with the CEDR

1 database, the OTIB has fairly good records on
2 construction workers. But we had to go down
3 to the level of detail of finding employee
4 numbers, job code numbers, department heads,
5 the department numbers to be able to pull out
6 the right construction so we can always be
7 clear that we are clearly pulling up
8 construction worker data.

9 **DR. NETON:** Can you maybe clarify something?
10 Early on the thrust of this project was to
11 look at building trade workers who were not
12 primes. The thought was that the prime
13 contractor or trades workers probably were
14 monitored or it was thought that they were
15 monitored better than maybe the subcontractor
16 building trade that was brought in to fill in
17 the gaps so to speak. And I've forgotten.
18 It's been a long time since I looked at that.
19 You were not able to tease that out at all the
20 sites because the data just weren't there.
21 But where you were able to tease out the
22 exposures for the prime contractor building
23 trades workers versus the ones that were the
24 subcontractors did you notice any differences
25 in their exposure patterns?

1 **MR. CHEW:** I think where we probably -- and
2 that's a good question -- probably the Oak
3 Ridge complex was the easiest way to pull that
4 out. And I'd like to add one thing in going
5 back to the interviews. Many of the
6 construction workers would -- and I'm going to
7 exaggerate this here -- one day they'll be
8 working for a subcontractor, the next day
9 they'll be working for a prime. So it almost
10 didn't make any difference here. And
11 especially it was the way that they were able
12 to receive their badging and getting into the
13 fenced areas. By and large I would say in
14 general what we were now looking at the data
15 with the question you asked, the people who
16 worked for subcontractors were probably, the
17 doses were probably smaller actually --

18 **DR. NETON:** My thought was --

19 **MR. CHEW:** -- and it would be expected to
20 see that, yeah. Because once they brought
21 them in. There was a couple of comments in
22 your --

23 **MR. MCGOWAN:** I'd like to comment on that if
24 I can.

25 **MR. CHEW:** Sure.

1 **MR. McGOWAN:** There are a number of
2 individuals, for example I know at Oak Ridge,
3 who spent their entire working careers at Oak
4 Ridge as construction workers even though they
5 were considered to be transient employees.
6 You have some people that had many, many years
7 of work there that would not have been thought
8 of in that fashion. You probably have a
9 bigger dataset at Savannah River from the
10 Fayerweather data than you would have, say, at
11 Oak Ridge.

12 And at Oak Ridge, we know that there
13 are individuals like the supervisor of the
14 work crew would bring in a whole busload in a
15 bus with the windows painted black of
16 individuals and bring them to a particular
17 location to work. None of them had security
18 clearance. None of them had badge, whatever.
19 They did the work in that location, were
20 trucked back out by that person. There's no
21 record of that.

22 **MR. CHEW:** And I appreciate what you're
23 saying here. I'd like to address that. We
24 actually did work at the coworker data. As a
25 matter of fact we actually had looked at the

1 analysis, and the Fayerweather data really
2 does not give us the breakdown of what we
3 looked at. As a matter of fact I noticed in
4 your report you even mentioned that the
5 Fayerweather data really has no additional
6 contribution or make any significant
7 difference than in the SC&A report.

8 **MR. MARSCHKE:** We looked at the Fayerweather
9 data which we got from the center. There was
10 no breakout by construction worker versus non-
11 construction worker so we couldn't break it
12 out that way. But what we did was we compared
13 all the workers to the HPAREH data, and we
14 found, you know, we have a plot in here in the
15 report which kind of shows that the
16 Fayerweather data tracks the HPAREH data but
17 it's lower.

18 Generally, the Fayerweather, at the
19 95th percentile, the Fayerweather data is
20 slightly lower than the HPAREH data. And also
21 at the average, and this is for all workers
22 because the Fayerweather data does not
23 identify the occupation of the workers. But
24 what we did, when you look at the figure in
25 here, you're three, two, four, you see that

1 the Fayerweather data, when each HPAREH data
2 goes up for a year, the Fayerweather data goes
3 up. But it's always a little bit less than
4 the HPAREH data.

5 **DR. MAURO:** Page 33 of the report.

6 **MR. MARSCHKE:** So basically, that
7 information, or any discussion of the
8 Fayerweather data is missing from OTIB-0052
9 and in that, you know, I think something
10 should be said about it. Whether or not it
11 changes the end results, you know, or if it
12 does the end results, it may change the 1.4.
13 It may drive the 1.4 down as opposed to
14 increasing it.

15 **MR. CHEW:** Well, we didn't go to that level
16 of analysis. I appreciate your doing that,
17 when I saw that. We abandoned it fairly early
18 because we weren't able to break it out by
19 construction, and we needed, that was clearly
20 what we needed to do. So if we didn't do that
21 then we wouldn't be doing (unintelligible).
22 That was the whole point here.

23 I'd like to just go back to a little
24 discussion about the Savannah River data. I
25 mentioned about the canyons being where the

1 two areas, but also remember people working in
2 those particular canyons would show high doses
3 for those particular years. Clearly, we asked
4 the question, they had to be Q cleared, and
5 they had to have security badges along with
6 their film badges.

7 So I think just to reinforce the
8 likelihood of an unmonitored person falling in
9 a grouping of less than 95 percent would be
10 highly unlikely.

11 **DR. MAURO:** So the point is that if, in
12 fact, all the construction workers, trade
13 workers including all the pipefitters were, in
14 fact, all monitored, and all of a sudden that
15 data showed up, you're expectation of their
16 distribution would be lower than that because
17 the ones that we happen to have are the ones
18 that were monitored. And the reason they were
19 monitored was because they had job
20 responsibilities that were putting them in
21 greater harms way from a radiological point of
22 view. So what I'm hearing is that this,
23 they're coming in high because they were given
24 jobs which were unusually more radioactive.

25 **DR. NETON:** Mel was saying for that

1 particular event, not universally.

2 **DR. MAURO:** Okay.

3 **MR. CHEW:** Right, if you track the average
4 pipefitter through a majority of the years,
5 they were below the unmonitored workers.

6 **DR. MAURO:** I understand that, but it goes
7 to particular years.

8 **MR. CHEW:** Sure. Sure.

9 When I think of, that was the first,
10 we've already had this discussion because I
11 think that was one of the key points that you
12 would like to have this explained. The other
13 part of the matrix, do you feel there is any
14 other one that you'd like me to tell some
15 detail?

16 **DR. MAKHIJANI:** Before we move on from
17 Savannah River I think the example you gave is
18 a good one and you make a very plausible case
19 that if they were going into the canyon area
20 and doing work on the piping there, that they
21 would likely be monitored as well as have
22 security badges.

23 But the counter example to that would
24 be something like the tank farm in the 1950s
25 and early '60s. There are a lot of leaks in

1 the first, I think nine of the first 16 tanks
2 leaked at Savannah River. And then when they
3 built the next generation of tanks it's much
4 better. So they have a lot of workers who
5 were kind of digging up stuff, cleaning up
6 stuff. They had a lot of subcontractors at
7 Savannah River site.

8 This is one of the reasons that I kind
9 of tried to insist on that tank farm database,
10 they didn't record all of the incidents. I
11 mean, in the databank itself it says we didn't
12 record everything that we considered
13 significant, but it got not criteria. And in
14 those kinds of circumstances, I kind of wonder
15 how much of this analysis actually applies,
16 especially if you don't address incidents in
17 TIB-0052.

18 So you have an unbadged worker who's
19 kind of doing clean up, and who is a
20 subcontractor, and he's there as a day laborer
21 brought in by some company, not tracked by a
22 union, especially the Savannah River site.
23 And so you've got multiple levels of problems
24 in how you apply this.

25 **MR. CHEW:** I'm glad this, Arjun, I'm glad

1 this morning we had the discussion about OTIB-
2 0020 and it also was ancillary leading up to
3 it because that's really important. Remember,
4 we're focusing on the unmonitored worker
5 that's talked about. And now we're going to
6 be assigning -- I hope I say this correctly as
7 a dose reconstructor -- we're going to be
8 assigning that unmonitored worker the 95
9 percentile of the all monitored worker data
10 which this data supports, and multiply that
11 time 1.4 to find that.

12 Which I'm now going to come back to
13 you, Arjun, and is it plausible that you're
14 going to find an unmonitored worker if that's
15 a scenario that you can describe that that's
16 not claimant favorable. Well, we feel it is
17 claimant favorable.

18 **DR. MAKHIJANI:** I think so. I think when we
19 looked at Y-12, and we tried to subject it to
20 the test to see whether workers were widely
21 monitored in the 1950s fell into the high dose
22 categories when they started being monitored
23 in the 1960s. We did find them.

24 So here we're talking about non-prime
25 contractor workers. Here we're talking about

1 prime contractor workers. Here we're talking
2 about deliverers who are there for temporary
3 jobs who might be doing clean up in radiation
4 fields that were quite high. Sometimes they
5 were ten R per hour, per hour. That's
6 documented in the databank, and to the extent
7 that I reported it accurately when I did the
8 study, you have those numbers. And in those
9 kinds of circumstances with the special kinds
10 of geometry that you have, I think at least
11 that the case needs to be made that this is
12 adequate for those kinds of circumstances.
13 Because I think that in the '50s especially,
14 because you make the case that in the '50s
15 construction workers would be working on
16 cleanup jobs, and I'm not sure that that's --

17 **DR. NETON:** No, no, I don't --

18 **DR. MAKHIJANI:** That's somewhere in the
19 matrix. That's there somewhere in the matrix.
20 That would generally be the case. You don't
21 have to worry. But I don't think that's
22 necessarily the case.

23 **MR. CHEW:** But we still have in those early
24 years, too, a significant number of exposure
25 assigned to the all monitored worker. And

1 that's where --

2 **DR. NETON:** There are exposures here being
3 assigned in the 1950s, about 1,000, 1,500 per
4 year to these workers. Now you're suggesting
5 there were unmonitored construction workers
6 working in Ten R fields, no badging
7 considerations at all. I've just not heard
8 that anywhere else before. I've never heard
9 that.

10 **DR. MAKHIJANI:** I'm not suggesting that they
11 were not badged. I'm pointing out that there
12 are, in the '50s, we know of situations where
13 there were workers in relatively higher
14 exposed categories not deliberately not
15 badged, but people were learning things.

16 People were, at least that was my
17 impression from having, that was my conclusion
18 going away from White, having looked at the
19 White data a lot. They were trying, and they
20 were learning things, and they were finding
21 the people to badge. And often they were
22 right, and sometime they were not. And that's
23 the kind of, if that was the situation with
24 prime contractor workers, I'm raising a
25 question rather than making a statement.

1 **DR. NETON:** This is no different than the
2 discussions we've had on monitored versus
3 unmonitored prime workers because what you're
4 saying is we have an example here where
5 there's a clear dichotomy between monitored
6 workers and building trades workers. Building
7 trades workers are much lower on average than
8 the prime contractors. And what you're
9 suggesting is that they didn't, the
10 preferentially only monitored the lower
11 exposed --

12 **DR. MAKHIJANI:** No, I didn't say that.

13 **DR. NETON:** Well, that's what would have to
14 happen for that comparison to be invalid, that
15 they would not be monitoring workers that were
16 more highly exposed.

17 **DR. MAKHIJANI:** I think they did not monitor
18 some workers who were highly exposed and
19 didn't monitor some workers who were highly
20 exposed, yes. I'm not saying that they
21 systematically excluded highly exposed
22 workers, of course not. We know that that
23 isn't true. But we do also, at least I feel
24 from having looked at the data, that there
25 were cases in higher exposure categories that

1 weren't monitored in the '50s.

2 **DR. NETON:** We're using the 95th percentile
3 distribution as well so --

4 **MR. CHEW:** But, you know, Arjun, we also
5 remember that we're talking about claims that
6 came in, coming in, that somehow we identified
7 that that person probably should be monitored.
8 And so now you have to look at that particular
9 individual claim to see where the data,
10 whether the specific TBD or TIB explains how
11 by his or her job description we're able to
12 assign that unmonitored exposure to him.

13 Arjun, I'm going to send this
14 particular graph down to you to show you some
15 of the history by year. And so clearly, some
16 of this beginning in the 1940s, people were
17 monitored. And so we have information on
18 people both construction workers and all
19 monitored workers dating back. And if you
20 really look at the graph itself, it's very
21 interesting. It's going to tell us a story
22 about the development of the weapons program
23 like I started talking about this morning.

24 And we tracked, the exposures were
25 tracked to see how the development occurred.

1 In the early years obviously zero
2 reconstructing and it started to build up, you
3 know, some of the early work at Atomic
4 Laboratory, the Hanford, you know, the
5 separation processes. And then DuPont was
6 involved with the early separation processes
7 at Hanford. And then they took it down to
8 Savannah River some of the separation
9 processes were better well defined. And so
10 they were able to build for their system.

11 Now to answer some of your questions
12 here, you're basically coming up with is it
13 really plausible, can I develop a scenario
14 like you just described? You know, I have a
15 person who worked in high radiation field for
16 a significant amount of time who really was
17 unmonitored. So will you have a way to get,
18 find exposures to that particular claimant by
19 taking the 95th percentile times 1.4. And do
20 you think we have bounded it? You think?

21 **DR. MAKHIJANI:** Two things, if you look at
22 the 2007 Inspector General report that just
23 came out about bioassay not external dose.

24 **DR. NETON:** Current exposures.

25 **DR. MAKHIJANI:** Current exposures but under

1 current rules. Are the rules being followed?
2 Are the workers being separated according to
3 low and high exposure categories by current
4 criteria? Which would also be, you know,
5 you're doing the best --

6 **DR. NETON:** I found it convincing that the
7 highest exposed workers were monitored in the
8 Inspector General report.

9 **DR. MAKHIJANI:** But are the workers --

10 **DR. NETON:** I thought that was the
11 conclusion.

12 **DR. MAKHIJANI:** That's not the point. You
13 don't know among the people who were entering
14 radiological areas who were not monitored
15 that's part of the point and studied the
16 report. I've scanned it --

17 **DR. NETON:** I looked at it, Arjun, and I
18 don't see that you're making a point by citing
19 that report. Go ahead.

20 **DR. MAKHIJANI:** Maybe not. And maybe you
21 studied it better than I have. But I think,
22 at least in the '50s and '40s, to step away
23 from the report which you read and I have, I'm
24 not saying that -- I think Steve put it well
25 when he gave an overview that there's no claim

1 in our review that this isn't broadly claimant
2 favorable to the vast majority of workers that
3 we're talking about. We're not, that's not
4 the claim.

5 I think that overview statement was
6 right, and we agree with TIB-0052 on that.
7 The question is are the categories of workers,
8 not just random people in the table, are there
9 categories of workers that TIB-0052 would not
10 pick up who are unmonitored construction
11 workers. And I think that for certain times
12 and certain types of workers that this is at
13 least plausible, and this idea should not be
14 rejected out of hand.

15 **DR. NETON:** I think it's speculation. We
16 can't live on speculation. If you look at the
17 comparison in the data, there's a factor, by
18 eyeball here, of at least a factor of four
19 difference between the construction workers
20 and the all workers. And we're comparing the
21 95th percentiles that are a factor of four
22 different, I have trouble believing that that
23 does not indicate that we're providing a
24 generous margin of dose to those workers who
25 were not monitored. And probably for the most

1 part many of them didn't need to be monitored.
2 But we're giving this to the people who
3 probably should have been monitored a factor
4 of four higher than what their counterparts
5 were receiving.

6 **MR. CHEW:** And the upshot of that is that
7 the unmonitored worker based on this process
8 is going to get more exposures than the
9 monitored worker.

10 **DR. NETON:** No, what I'm saying --

11 **DR. MAKHIJANI:** Yeah, I recognize it's --

12 **MR. MARSCHKE:** If you look at 152, if you
13 look at the Oak Ridge data, I mean, from 1972
14 on basically the ratio of construction worker
15 to all monitored worker is greater than, it's
16 1.5 or greater. And so how do you, if you
17 look, one of the questions is how did you
18 settle on 1.4?

19 **MR. CHEW:** I'd like to answer that. It's a
20 very good question. There was a considerable
21 amount of discussion when 1.4 was arrived at.
22 You pointed out some very good information
23 that especially in the latter years, most
24 people were monitored and construction
25 workers. They worked multipliers even much

1 greater than 1.4, 1.5, 1.8, 1.9. As you can
2 see here we even listed them.

3 But why we did not include that in the
4 1.4 is you really looked at the exposure
5 itself, exposure itself. Then the value of
6 the exposure at the 95 percentile, they are
7 down in the hundreds or less than a hundred
8 millirem. And we thought it that no matter
9 what you did it would probably be not in the
10 compensable category. So we focused in on
11 where the exposures were of a higher value in
12 the rem categories --

13 **DR. NETON:** There's also the monitoring all
14 the workers. We've got the entire workforce
15 monitored. Badges were handed out very
16 readily to all workers at that point.
17 Construction workers who were brought in maybe
18 for specific jobs would be higher at that
19 point, but they're monitored.

20 **MR. MARSCHKE:** See, there's a lot of stuff
21 that went into the selection of OTIB-0052.
22 And one of the selections is 1.4. A lot of
23 thought processes went into this is not really
24 reflected in the document itself.

25 **DR. NETON:** Yeah, well, that's the problem.

1 We're writing documents for our own guidance.

2 **MR. MARSCHKE:** So when we look at it we have
3 these questions, and again, we looked at it.
4 We could see that, you know --

5 **MR. CHEW:** Steve has a very good point.
6 When we first, actually for all the years for
7 all the sites we studied, we actually took the
8 ratios for every year. Most of them were
9 below one. And you know that already. Well,
10 I said, well, is that the way to present the
11 information.

12 Let's really step back and take a look
13 at it. How many of them are above 1.1, 1.2 or
14 1.3? Where are we going to see the trend of
15 what a reasonable coworker adjustment factor
16 would be? And we looked at all the numbers
17 and the exposure itself in consideration. And
18 then 1.4 was consensus-wide, the reasonable
19 adjustment factor here.

20 **MR. MARSCHKE:** The selection of 1.4 to me is
21 very much subjective and that's why we did
22 this proof in the pudding type where we ran
23 the samples to see how robust the 1.4 was.
24 And we were, I guess one could say pretty well
25 pleased that for most of the samples that we

1 ran -- I think we ran about 60 samples.
2 Twenty at each of the three sites that we
3 looked at. And we only had a handful or so
4 that basically the OTIB-0052 methodology
5 produced lower results than the measured
6 results, and then not more than a factor of
7 two lower. So it seemed to always produce
8 either doses that were very close to or above
9 what the measured doses were. So but again,
10 there's a lot of questions, I know there's a
11 lot of questions out there from the meeting we
12 had with the center as to how the 1.4 was
13 decided upon. And because there are a lot of
14 numbers out there which are greater than 1.4.

15 **DR. MAURO:** When you say they're greater
16 than 1.4, is for the ten year, for duration of
17 the --

18 **MR. MARSCHKE:** No, that's just for --

19 **DR. MAURO:** I think the interesting problem
20 is this. You have a worker, and what we have
21 seen here is that it's possible that in a
22 given year, a given worker who was not
23 monitored may very well, it's possible, have
24 gotten exposure more than 1.4 times, that is,
25 if you use this method for that year. Because

1 you're operating at the 95th percentile the
2 probability that ten years in a row --

3 **DR. NETON:** No, I understand that.

4 **DR. MAURO:** -- that's not going to happen.
5 So there's no doubt when you're looking at a
6 stretch of time for a worker where he's there
7 for every year, and we're going to assign him
8 every year not the 95th percentile year after
9 year, 1.4 times year after year. So I have to
10 say when I look at that I say I buy that. But
11 the dilemma then becomes what about the person
12 that was just there for one year.

13 And you apply this, and he's a
14 pipefitter. It seems to me there's a very
15 real possibility that he's just -- and this is
16 going to be a rare occasion -- and he was
17 unmonitored, and so it's almost like when are
18 we conservative enough. From reading the
19 report and asking questions just like we're
20 asking now, I am convinced that over a stretch
21 of time, the methodology as you've developed,
22 the chances that one person year after year
23 after year after year who's unmonitored go the
24 upper 95th percentile times 1.4 for every one
25 of those years, the probability of that

1 occurring is zero or approaches some
2 astronomically small number.

3 But for any given one year, I would
4 say there's a very well possibility it could
5 have happened to some people. It might have
6 been just for one year. Is that good enough?
7 And that becomes almost like a judgment call.

8 **DR. NETON:** The question is though Mel has
9 pointed out a couple of instances where those
10 couple years are high because it was a point
11 where we believe that they would have been
12 monitored so that kind of goes away.

13 **MR. MARSCHKE:** They were doing specific
14 tasks.

15 **DR. MAURO:** They were doing specific, that's
16 where --

17 **DR. NETON:** -- job and we can account for
18 that at the Savannah River site. But I'm not
19 sure how many --

20 **DR. MAURO:** Well, that person never existed.
21 In other words, that person doesn't --

22 **DR. NETON:** Those people probably don't
23 exist.

24 **MR. CHEW:** And, John, look at this tail
25 here. Remember, if you look at the DOE

1 complexes in the graph it's kind of
2 interesting, the exposures here and tailing
3 off because the Cold War ended here, and then
4 the breakdown. These doses, even though where
5 we talk about numbers, are low. Even though
6 you can multiply times two or 1.81.9, whatever
7 number you want. That's why we just kind
8 of... But we presented in the graph because
9 it was there so that's our actual data. We
10 did focus in clearly on this particular period
11 of time where the exposures are significant
12 enough that it would make a difference.

13 **MR. GRIFFON (by Telephone):** Mel, this is
14 Mark Griffon. Been listening in to this. The
15 one question I had, in the overview Steve
16 mentioned this concern that SC&A has about
17 the, and I think John just sort of highlighted
18 again, the sort of category for less than
19 five-year period or three-to-five or whatever
20 the cutoff there was.

21 And that's what John was sort of
22 raising where when, would be conservative in
23 that regard. I just wanted to, I wondered if
24 you assessed what the magnitude of that
25 population could be because if I'm looking, I

1 have some numbers for a couple sites. And it
2 seems to me for some of the construction
3 workforce you could have a fair percentage of
4 workers that fall into that less than five
5 year category. It's not that unreasonable.

6 I mean, the Nevada Test Site for
7 instance in the medical monitoring program I
8 just looked up some numbers. It was like 850
9 out of 2,700 that reported less than five
10 years work. So it's not like all these guys
11 have ten, 15 years at the site, so a little
12 more, at least for some of the sites. I
13 wondered if you assessed that at all in your
14 analysis in TIB-0052.

15 **MR. NETON:** Well, I don't think we did, Jim,
16 I don't think we that we looked at it in those
17 narrow brackets, but the example you used, the
18 Nevada Test Site, it comes to my mind that
19 most of those people were monitored after a
20 certain year. We have very good monitoring --

21 **MR. GRIFFON (by Telephone):** Yeah, and they
22 could have been, yeah, I didn't crosswalk that
23 with whether they were monitored or not,
24 that's true.

25 **DR. NETON:** This doesn't make a difference

1 in the dose reconstruction. The thought comes
2 to mind if a person only worked a year or two
3 the chance of their dose becoming high enough
4 to be compensable is pretty slim. But that's
5 probably not a good argument to make.

6 **DR. MAKHIJANI:** We actually have a number
7 here for Hanford from Eula Bingham. I mean,
8 we have independently verified it, but she
9 brought this up. You know, the short-term,
10 long-term thing came up during our interview
11 with CWR, and I just, so we asked, you're
12 expressing the concern that workers who were
13 there for shorter periods may have been there
14 when the factor of 1.4, when 1.4 factor may
15 not apply. So we asked her that and Eula
16 said, yes, some worked for short periods, some
17 not. At Paducah construction workers average
18 length of employment was about three years.
19 At Hanford it was 15 years. Oak Ridge was 17
20 years. So it's all over the map, and so you
21 actually, if the average length of employment
22 for construction workers is three years, then
23 you have a problem for some groups of workers.

24 **DR. NETON:** Only if they were unmonitored.

25 **DR. MAKHIJANI:** Then you have this whole

1 thing about, you know, the other thing that
2 came up is that DOE has even lost track of the
3 subcontractors let alone knowing where workers
4 are. So the whole question of whether you
5 call it your records, who was monitored, and I
6 think especially for the early years, I don't
7 think that they can be dismissed saying that
8 we knew who was being monitored. Well, at
9 Rocky Flats we have documentary evidence that
10 even though the Health Physicists in the field
11 knew that the people who were exposed to
12 plutonium tetrafluoride were at risk of
13 neutron exposure, they decided not to monitor
14 the people in Building 71 for neutron exposure
15 until 1956. And that is in the history of the
16 Rocky Flats site. So it's not necessarily
17 that the Health Physicist didn't know what was
18 going on, but it was management decisions how
19 to do certain things. And when we have that
20 documented for secure workers in the '50s at
21 Rocky Flats, I think the burden of proof in
22 the way I read the regulation, had to be, at
23 least for the '50s, on the government to say,
24 okay, we know that everybody with high
25 exposures were monitored and this is going to

1 cover it because I think --

2 DR. NETON: Well, you're challenging the
3 entire coworker approach. This just goes
4 beyond, this is the entire coworker model
5 approach then you're challenging.

6 DR. MAKHIJANI: Well, for a certain period -
7 -

8 DR. MAURO: Short term.

9 DR. MAKHIJANI: No --

10 DR. NETON: For any period really.

11 DR. MAKHIJANI: No, I think, no, the reason
12 I've said that if you're adding 95th
13 percentile, then a factor of 1.4 over ten-year
14 periods, first of all it's a very long period,
15 then the probability that you're going to be
16 on the short side is very low.

17 DR. NETON: Well, I don't follow that
18 argument, Arjun. I mean, you're saying that's
19 okay, but then just before that you said that
20 we don't even know who was monitored and when
21 and why. I mean, you've got two extremes you
22 just pointed out to me, and one is right and
23 one is wrong. I mean, I don't understand
24 that.

25 DR. MAKHIJANI: I think that my statement is

1 a little more nuanced than you hear them.

2 **DR. NETON:** I don't know. We don't know who
3 was monitored at Rocky Flats. They purposely
4 didn't monitor them, and they just ignored it
5 because for whatever reason they made a
6 management decision not to.

7 **DR. MAKHIJANI:** I made a more careful
8 statement about what's in the history of Rocky
9 Flats about who was monitored. Now, this is
10 not Arjun Makhijani waking up one day and
11 making a decision about what happened over
12 there. We do know that in Building 71 neutron
13 monitoring started in 1956.

14 **MR. CHEW:** And we're not here to argue about
15 Rocky Flats again because we've done that for
16 two years here. I would like to say I would
17 highly unlikely that a construction worker
18 would be working in front of plutonium
19 fluoride. I just want to discuss that point,
20 and let's dismiss that. Let's focus in on
21 really construction workers.

22 And I have the categories here, and
23 what are the likelihoods of them really being
24 exposed to a significant level above the all
25 monitored worker which is now the coworker

1 study here multiplied times 1.4. That's
2 really the bottom line here, and we need to
3 focus on that.

4 **DR. MAKHIJANI:** Let us focus on that because
5 just now or twenty minutes ago, the argument
6 was made that if they are in a secure area,
7 they'd have a security badge and a badge. And
8 therefore, and everybody who went in there,
9 therefore, by analogy construction workers
10 would also have been badged.

11 Now I'm saying that you're in a secure
12 area in the '50s. We have in an area where
13 there were known to be neutrons we had
14 unmonitored workers in the most secure area at
15 Rocky Flats. So I'm just picking up your --

16 **MR. SHARFI:** SEC issue versus a --

17 **DR. MAKHIJANI:** No, no, no, it's not an SEC
18 issue.

19 **DR. NETON:** Why were they not monitored
20 though, Arjun? You didn't finish the story.
21 Because they were judged to be below a certain
22 monitoring threshold.

23 **DR. MAKHIJANI:** No.

24 **DR. NETON:** Yes, they were. They were
25 judged to be below a certain monitoring

1 threshold.

2 **DR. MAKHIJANI:** I have the history in my --

3 **DR. NETON:** Well, they didn't not monitor
4 because they were the most highest exposed
5 workers. I mean, that's the point is that
6 they were judged to have an exposure that
7 didn't meet a certain monitoring threshold, a
8 criteria. And so when you start badging the
9 higher exposed workers, these studies are even
10 more generous because you've got a subset of
11 higher exposed workers, and we're taking the
12 95th percentile of that. I don't think that
13 they just deliberately didn't monitor the
14 workers in the plutonium facility because they
15 were high. It was a rational decision made
16 why they weren't monitored, and that's the
17 rest of the story.

18 **DR. MAKHIJANI:** Well, I don't think that the
19 history of Rocky Flats represents a rational -
20 -

21 **MR. CHEW:** They came and measured it and so
22 they know what the exposures were, and so they
23 made their decision.

24 **DR. NETON:** Yeah, my recollection was that
25 there was a 500 millirem cutoff or something

like that for monitoring.

MR. CHEW: Where the MDA film can --

DR. ZIEMER: Mel, on the histories, to what extent can you identify these individuals? Were they keeping lifetime histories in the '50s for these folks?

MR. CHEW: Yes, yes.

DR. ZIEMER: It wasn't required until the '60s. So most of these are actually identifiable people.

MR. CHEW: Yes, they are. Every one of these working points are identified people. We did that, it's a very intelligent point. No, that was the only way we can get the construction worker --

DR. ZIEMER: Because I know at Oak Ridge, and this goes back to the '50s now, you always, you determined on the construction workers by job whether you monitored them beyond even a film badge. And typically you had HPs with stop watches and survey instruments because you were really interested in daily and weekly limits.

And in the early days the limits were not life. There were no lifetime limits.

1 They were basically weekly limits and daily
2 limits for administrative purposes. But even
3 if you didn't know the identity of a person,
4 you could pretty well guarantee that they're
5 not going to get more than a certain amount a
6 week if they're working in a high dose area.
7 It perhaps was different in other facilities,
8 but I couldn't imagine any worker, say at Oak
9 Ridge, coming in and working in a high dose
10 area and not being monitored.

11 **MR. CHEW:** That's our point.

12 **DR. ZIEMER:** It would be equivalent of a
13 work permit. You had to have --

14 **MR. CHEW:** I know I'm being redundant here,
15 but we are focusing on the person who is
16 unmonitored or would have information that's
17 missing in his monitoring record, that's fair,
18 right? And we are going to be assigning that
19 particular (unintelligible) would be without
20 the information the 95th percentile of the all
21 monitored worker where I think that shows
22 clearly through all of the sites except for
23 the few years that we discussed about.

24 And wherever, as a matter of fact in
25 our study, when we did the study, every time

1 we saw that the construction worker data was
2 above potentially the all monitored worker,
3 even at ten percent of the 1.2 times, we
4 clearly tried to identify and go back to know
5 what operations that we know of and try to
6 identify what they did and were the people
7 monitored. And so what was the likelihood of
8 unmonitored?

9 We've got to also look at some of
10 these particular sites, and the important
11 ones. If you look at Hanford; you look at
12 Idaho; you look at Savannah River, these are
13 the very large sites. And so people can come
14 in and out of all those sites including the
15 deer as you well know. And so there are
16 fences around those particular sites that have
17 the separation and materials here. And so
18 there's clearly a control point where people
19 would come in. And also in the early days
20 both areas were classified and secured area,
21 they would have been monitored.

22 Anyway, I think, Wanda, if SC&A has
23 any other points on the matrix that we
24 responded that they are still lacking
25 clarification, we have no problem. I think we

1 discussed the subject maybe to their
2 satisfaction I hope.

3 **MS. MUNN:** In skimming down the NIOSH
4 response column to the matrix, it seems to me
5 we've covered in our discussion most of the
6 items fairly well that are mentioned here in
7 one way or another.

8 **MR. CHEW:** I'm just kind of curious, I'd
9 like to say something, Wanda. Item number 2-
10 8, you asked us to go look at the HPAREH, I
11 mean, basically all the external doses are
12 from HPAREH. Needs to evaluate other doses
13 like Fayerweather, ABST. Why did you want to
14 put that issue in because you thought yourself
15 it was an issue? I'm just kind of curious why
16 that was in there.

17 **MR. MARSCHKE:** Again, to make the document
18 harder. To make the document more, you know,
19 to somebody picking up the document and
20 reading the document who has a knowledge of
21 Savannah River, they know that HPAREH is not
22 the only data source of data out there. So I
23 would think a statement to that effect that we
24 have looked at Fayerweather and so and so
25 forth is basically, that type of statement.

1 **MR. CHEW:** Well, see, we happen to know when
2 our initial view graph to Savannah River at
3 the meeting, we also mentioned we had looked
4 at the Fayerweather data. And so a year later
5 after we put the document together, we just, I
6 apologize. We didn't put that in.

7 **MR. MARSCHKE:** If that, in fact, is the case
8 when you do look at it, you get results which
9 are similar to what we got.

10 **MR. CHEW:** I certainly hope so.

11 **DR. NETON:** One issue that we -- I'm sorry.

12 **MS. MUNN:** Go ahead.

13 **DR. NETON:** I'd like to bring up that we
14 didn't talk about is this finding about that
15 we didn't do the modification that we had
16 discussed with CTWR. I feel like we do owe an
17 explanation for that. It is true that Mel and
18 I and I think Justin Conoyer met with CTWR in
19 Silver Springs and had a very engaging
20 conversation with the folks there including an
21 expert exposure assessors. Primarily an
22 industrial hygiene background, but they
23 brought to the table some very good expertise
24 in exposure assessment particularly when
25 you're dealing with air sample data.

1 And we discussed a number of options
2 as to how we could move the internal dose
3 assessments forward. And after looking at a
4 lot of air data, we decided, well, maybe it
5 would be more appropriate to increase the GSD
6 on our, geometric standard deviation, on our
7 values for internal and apply them that way
8 and take a 95th percentile and reconstruct
9 doses that way.

10 And as it turns out when went back,
11 and we tried to apply that to our dataset, we
12 ended up with implausibly large values. I
13 mean, just tremendously high intake values
14 that made no sense in light of what we know
15 about the general exposures at the plant. And
16 that's when I started having discussions with
17 other folks, Mel included, to say, hey, we
18 have internal dosimetry bioassay data where we
19 can differentiate just like we did with
20 external construction workers, non-
21 construction workers.

22 And that's where we ended up, using
23 the real data which the nice feature is that
24 it takes care of the, you don't have to
25 extrapolate from air sample data any more,

1 these extremely large potential geometric
2 standard deviations. You have bioassay data
3 from people that tightened up the distribution
4 substantially and gave us what we felt a much
5 better representation of the exposure of this
6 cohort that we're dealing with. That's the
7 nutshell explanation for that.

8 **MR. CHEW:** I would like to add one more to
9 consider. That was quite a discussion at the
10 meeting. It also eliminated by using actual
11 bioassay data any issues about different
12 breathing rates and things like that.

13 **DR. NETON:** Right. Breathing rates go away,
14 and the oronasal breathing goes away. The
15 number hours worked in a week goes away. All
16 the correction factors that we were talking
17 about went away. The bioassay data is an
18 integrated sample during the activity no
19 matter how long or how hard you breathe.

20 **MR. CHEW:** But it forced us to spend a
21 considerable amount of time --

22 **DR. NETON:** We put in a lot of effort.

23 **MS. MUNN:** As long as you can get it.
24 Getting it there is the important thing.

25 John, is SC&A okay with OTIB-0052?

1 **DR. MAURO:** Steve, are there any other items
2 in here that you think need to be raised?

3 **MR. MARSCHKE:** We haven't talked about
4 neutrons yet, and OTIB-0052 is also quiet on
5 neutrons. And we do have one comment and one
6 finding in the matrix where we basically, we
7 raise the neutron issue. And you have a
8 response here, and I guess you're applying the
9 same 1.4 multiplier to neutrons --

10 **MR. CHEW:** To the total exposure.

11 **MR. MARSCHKE:** To the total exposure which
12 would include the neutrons as you would apply
13 just a straight gamma dose. I don't know. Do
14 we want to get any more into that or --

15 **DR. MAKHIJANI:** Steve, just a memory
16 question. You wrote the report so I don't
17 remember. Didn't you find that in some sites
18 neutrons were included and some sites they
19 were not? That's my memory.

20 **MR. CHEW:** That's true.

21 **DR. MAKHIJANI:** So I think it's not
22 consistent that the 1.4 is being applied. Am
23 I wrong about that?

24 **MR. CHEW:** No, because if you compare site
25 to site construction worker or all monitored

1 worker, that individual site stands alone
2 here. So if neutron doses were applied, it
3 would be applied both the all monitored worker
4 and the construction worker for that
5 particular site. Now, I think Savannah River
6 was the only one we really found that had
7 neutron doses. And we really did not find
8 much neutron dose exposure to construction
9 workers. There's another claimant
10 favorability because the all monitored worker
11 had more neutron exposure.

12 **DR. MAKHIJANI:** But you're not applying the
13 1.4 to neutron doses. I didn't understand.
14 It's just a question. I don't have a
15 statement about it.

16 **MR. CHEW:** You apply the 1.4 to the total.

17 **DR. MAKHIJANI:** Including from all sources.

18 **MR. SHARFI:** The deep dose and the neutron
19 dose, not the shallow.

20 **MR. CHEW:** Right, not the shallow.

21 **DR. MAKHIJANI:** I think it goes in the
22 analysis that in developing the 1.4 that in
23 some cases only the deep dose was counted, and
24 in some cases the neutron dose was counted.
25 There's some finding there that I'm not

1 remembering correctly now because I totally
2 read the report from end to end recently, from
3 beginning to end I should say.

4 **MR. MARSCHKE:** The Rocky Flats data the data
5 that was used in the Rocky Flats analysis, I
6 think had the neutron data --

7 **MR. SHARFI:** In that which would be the
8 gamma plus neutron.

9 **MR. MARSCHKE:** And if you look at the Rocky
10 Flats coworker OTIB as I recall, there are two
11 or there is a construction worker table that
12 has columns for both for gamma and separate
13 columns for neutrons. So that's clearly
14 they're applying the 1.4 to both.

15 **MS. MUNN:** To total dose, total dose.

16 **DR. MAKHIJANI:** But we only found that at
17 Rocky Flats, right?

18 **MR. MARSCHKE:** I think that was only at
19 Rocky Flats where really the neutron
20 (unintelligible). At Savannah River I think
21 they, each (unintelligible) characterized the
22 doses as penetrating dose.

23 **MR. SHARFI:** I think they're separate. They
24 have an open window, a shallow and a neutron
25 report.

1 **MS. MUNN:** Regardless, you're still
2 comparing site worker to site worker not site
3 worker to some other site worker. So you're
4 still comparing badged at this site with
5 unbadged at this site. So you're covering the
6 same ground no matter what.

7 **DR. MAKHIJANI:** That's right.

8 **MS. MUNN:** With that let's take a quick 15-
9 minute break and then we will come back and
10 address TBD-6000 briefly. We'll have a wrap
11 up of action items, and we'll talk about one
12 or two other things that we may not have had
13 an opportunity to touch on this morning.

14 **DR. WADE:** We're going to take a brief break
15 so we'll mute the phone. We'll be back in,
16 what did you say, five or ten minutes?

17 **MS. MUNN:** Ten minutes.

18 **DR. WADE:** Ten minutes.

19 (Whereupon, a break was taken from 3:40 p.m.
20 until 3:50 p.m.)

21 **MS. MUNN:** As we reconvene there's one item
22 which we did not have an opportunity to touch
23 on before lunch which I had hoped we might
24 have some discussion on. And that's where we
25 were on the few items that were still

1 outstanding on the first matrix. But we won't
2 address that right now. I'll just postpone
3 that a little bit until we have addressed the
4 couple of immediate issues that we have before
5 us, the first one being a discussion of TBD-
6 6000.

7 **DISCUSSION OF TBD 6000**

8 That's recently, as you know, out and
9 operating. And I think John touched earlier
10 on one of the actually administrative issues
11 that are before us with respect to Appendix
12 BB. I believe that you all received a copy of
13 the memo that John sent out asking about our
14 authorization for them to continue their
15 expectation in pursuing a review of the
16 appendix to TBD-6000.

17 John, would you like to expand on that
18 just a little?

19 **DR. MAURO:** Yeah, right now based on the
20 marching orders given to us what we're doing
21 well along is reviewing TBD-6000. TBD-6000 by
22 the way is the generic guideline for all
23 metalworking AWE facilities. It doesn't
24 include refining, but simply the metal that's
25 being worked.

1 And it's a generic model that was
2 developed by Battelle and is intended to be
3 used where you don't have site-specific
4 information. Accompanying TBD-6000 are, I
5 believe, about 15 appendices each one dealing
6 with site-specific information. That sort of
7 sets the stage. Now where are we?

8 We are performing an in-depth review
9 of TBD-6000 which in effect says here are the
10 default airborne radionuclide concentrations
11 of uranium, of thorium, recycled uranium and
12 its composition that we believe represents a
13 plausible upper bound for different categories
14 of workers for different time periods at these
15 AWE facilities. And all of this data was
16 gathered basically from a review of work by
17 Kingsley and Harris. It's one of the
18 definitive pieces of work on this subject.

19 As of this date we've carefully
20 reviewed Kingsley and Harris and affirmed that
21 the numbers that have been adopted represents
22 the upper end of the numbers there for
23 airborne exposure, inhalation exposures, but
24 we have also determined that there are other
25 sources of very comprehensive data in addition

1 to Kingsley and Harris that are not cited in
2 that TBD that we are looking at also.

3 Of particular relevance is the report
4 that we've talked about in the past that I
5 referred to as the Adley, A-D-L-E-Y, Report,
6 and also there's a lot of data from Simonds
7 Saw that is very valuable. So there are other
8 source documents beside Harris that we're
9 using to evaluate the airborne dust, default
10 airborne dust loadings contained in TBD-6000.
11 We'll be reporting on that.

12 From the point of view of external
13 exposure, there are default values for if a
14 person were working with uranium, enriched,
15 recycled, depleted, whatever form of uranium
16 and at different geometries, there were
17 billets, rods, ingots, there's a wide variety.
18 And in the TBD they have a long list of these
19 different types of geometries of uranium that
20 could represent a source of external exposure.
21 We have already in the past ran our MCNP
22 calculations to see what the radiation fields
23 are for some of those uranium chunks and where
24 we've matched their numbers. So for the ones
25 we've looked at so far, we've confirmed that,

1 yes, we agree that these are, in fact, the
2 radiation fields you would get if one foot
3 away.

4 **MS. MUNN:** They're tracking well.

5 **DR. MAURO:** They're tracking very well.

6 So right now the status is that the
7 external so far is tracking well, but we're
8 doing more work. We're still looking at other
9 geometries. The internal, we confirmed that
10 they used the Harris Report, very sound source
11 document for the early years which is
12 especially important.

13 But we're also right now in the middle
14 of that as we also comparing those data
15 against other important source documents which
16 are not cited in the TBD. And where they'll
17 have all of the TBD-6000 evaluations, all the
18 work, completed in time for an oral
19 presentation for the September 4th full Board
20 meeting.

21 **MS. MUNN:** Full Board call, September call.

22 **DR. WADE:** Full Board call.

23 **DR. MAURO:** Did I say call or meeting?

24 **DR. WADE:** You said meeting. You're right.
25 It's a meeting, but it's a phone call.

1 **DR. MAURO:** But more important than that
2 from our perspective because TBD-6000 in many
3 respects is an aggregate, a compendium of
4 information that we've already, that we've
5 looked at in the past as part of the work
6 we've been doing all along on AWE sites. What
7 is new, and I think of great importance when
8 we last met, when Senator Obama's, when one of
9 his staffers read a letter, was Appendix BB,
10 which is the General Steel, GSI. Isn't it
11 General Steel Industries?

12 **MS. MUNN:** Correct.

13 **DR. MAURO:** And that is a new problem. What
14 I mean by a new problem is General Steel
15 Industries, its job was to do nondestructive
16 testing of large metal components which
17 included uranium. But at the same time that
18 was only a small part of what they did. They
19 also did nondestructive testing using a 25 meV
20 data chart of a whole broad array of
21 components made of different alloys. So what
22 we're in the middle of doing is evaluating
23 that, and at that point I'd like to pass the
24 baton to the fellow that's doing the work,
25 who's on the phone, is Bob Anigstein. He's

1 our physicist that runs MCNP which is the
2 definitive model.

3 **DR. ANIGSTEIN (by Telephone):** Excuse me. I
4 don't run MCNP --

5 **DR. MAURO:** Okay, that runs the program that
6 our MCNP program because we have other people
7 than help us. With that, Bob, could you tell
8 us where you are on that part of the
9 evaluation?

10 **DR. ANIGSTEIN (by Telephone):** Sure --

11 **MS. MUNN:** Bob?

12 **DR. ANIGSTEIN (by Telephone):** Yes.

13 **MS. MUNN:** Before you begin this is Wanda.
14 It wasn't clear to me that all of the
15 different types of alloys and components that
16 were being looked at were, in fact, materials
17 that were covered by the program. Are we
18 talking about, I know General Steel did both
19 types of work, public and private, and are we
20 looking, I trust we're looking only at
21 materials and components that were included
22 under DOD programs or DOE programs.

23 **DR. MAURO:** Perhaps I should answer that,
24 Bob.

25 **DR. ANIGSTEIN (by Telephone):** Yes.

1 **DR. MAURO:** We've been operating under the
2 premises very similar to what we did under the
3 Dow investigations. That is, if an
4 organization, private sector organization, is
5 given a contract to provide a service to the
6 weapons complex similar to the way Dow was
7 given a contract to roll some uranium, it at
8 the time of that contract there were other
9 activities going on within that facility
10 involving radioactive materials, such as at
11 Dow at the time they were rolling uranium they
12 were also making thorium alloy.

13 Any exposures that workers would
14 experience during the covered period would be
15 included. So even though it was, for example,
16 the thorium operations at Dow were not AEC
17 operations. They were occurring at the same
18 place at the same time that the AEC operations
19 were taking place, but as a result.

20 **MS. MUNN:** So we can segregate them?

21 **DR. MAURO:** So now swing over to General
22 Steel Industries. We've been operating on the
23 premise that at the time that people were
24 performing nondestructive testing of uranium
25 slices, billets, that came from I believe

1 Mallinckrodt, they were also, that was just
2 one more piece of metal that was undergoing
3 nondestructive testing. So what we've been
4 doing is evaluating the radiation.

5 So what we see is well, we have a
6 worker here. His job is to use the Betatron
7 to irradiate and get a picture of the
8 imperfections in a uranium slab. Well, right
9 behind that there may come a component, a
10 steam generator, a pressure vessel or some
11 other large component. He just moves it in
12 and does it, and then another uranium may come
13 in. So the operation, the way we're looking
14 at it, the operation was an ongoing operation
15 where components were moving in and moving out
16 getting X-rayed.

17 So what we're doing right is
18 evaluating what the -- and Bob will describe
19 what he's doing -- what the radiation field is
20 due to the photoactivation. That is, when you
21 use a 25 meV Betatron, the energy is so high
22 that you cause activation unlike, you know,
23 neutron activation would occur at low
24 energies, but I think the threshold -- Bob,
25 let me pass it back to you at this point.

1 The answer to your answer is, yes,
2 we're looking at not only uranium but
3 everything else.

4 **MS. MUNN:** All right, thank you.

5 **DR. ANIGSTEIN (by Telephone):** Let me start
6 by clarifying my role in the project. My
7 background is in nuclear physics, and I am
8 familiar with MCNP. I haven't taken a course
9 in it; however, the actual runs are being done
10 by someone who is an expert who's been doing
11 this for many years, and who can do this more
12 efficiently and more competently.

13 We work together as a team. This
14 is a man by the name of Dick Ulsher*, who's an
15 associate of SC&A, and I pass on the
16 specifications for the runs. He sends me back
17 the MCNP results. We discuss the significance
18 and just to clarify that. I don't want to
19 pretend that I'm an MCNP expert.

20 What we're planning to do. So far
21 we've done, as John said, we verified this
22 uranium billet because that's a generic case,
23 and, yeah, we agree with it. Actually, our
24 results were slightly lower so we're in the
25 same ballpark. We also verified the gross

1 exposure rate from uniformly contaminated
2 floor. We're going to do some further work on
3 that, but the preliminary results show that
4 we're in the same ballpark as the rates that
5 are published in TBD-6000, which are applied
6 also to General Steel.

7 Further than that we did a preliminary
8 run on photoactivation to get that, to do a
9 definitive work on, I should really say
10 photofission of uranium, required the use of
11 the MCNP X, version 2.6, which is actually a
12 beta release. It's not available for general
13 use, but it is available to beta testers, but
14 there's a large number of them.

15 So obviously, NIOSH has someone with
16 access to a code, and they can, our associate,
17 Mr. Ulsher, has access to that code. And the
18 reason is that there is a version, MCNP X 2.5
19 that is publicly available. It came from Oak
20 Ridge, at Oak Ridge. However, that does not
21 do delayed gammas. So with the MCNP X 2.6,
22 you can run it for any designated period of
23 time, and it will give you the exposure or
24 dose rate or whatever tally one wishes to use
25 as a function of time following instantaneous

1 irradiation of the, during the very short
2 period of time, picoseconds or something like
3 that.

4 And then how it gets activated and
5 then how you get the decay, you know, usually
6 there's radioactive decay, and also possibly a
7 build up of fission products. It does
8 activation and fission products, but for
9 uranium the fission product would far outweigh
10 the activation. For the lighter elements the
11 activation would be important because one is
12 photo induced fission, the other one is the
13 high energy photons knocking neutron out and
14 create a new isotope. We are planning to do
15 those runs.

16 Right now I'm studying the material we
17 got from Los Alamos at Los Alamos Declassified
18 Report which gives a little bit of information
19 about techniques, radiography techniques used,
20 and probably more important is the worker
21 reports, basically worker interviews as to how
22 it was really done.

23 And finally, basically we can simply
24 set up the exposure parameters based on the
25 fact that you have a film. You have a slab of

1 uranium. You have to get a certain amount of
2 radiation through that uranium to expose the
3 film. Typically, it's one rad is a typical
4 number for film exposure. So that tells you
5 how much radiation is coming in at the front
6 end to get the desired exposure at the back
7 end at the film.

8 So this is all, we did one preliminary
9 run, but this is still in the planning stage
10 to do more once we get definite, because it
11 takes quite a, these runs themselves on a
12 high-speed machine can take days. So we want
13 to get all our ducks lined up and make sure
14 we're using the right parameters so we don't
15 have to repeat it too many times.

16 And right now we need some more
17 information because based on the ORNL surveys,
18 there are apparently two, at first glance they
19 look similar. They look like the same
20 diagram. When you look more closely there are
21 two different Betatron buildings, and they,
22 where I'm at right now is just giving you a
23 snapshot.

24 What is a puzzlement is what is called
25 the old Betatron building has two circles, and

1 it says Betatron One, Betatron Two within that
2 building. So it seems that both Betatrons
3 were located in the same building. What is
4 the role of the new Betatron building I'm not
5 sure at this point. I have to do some more
6 investigation.

7 When ORNL did it's surveys, both 1989
8 was the initial survey which resulted in that
9 location being declared a FUSRAP site, needed
10 remediation, even though it was really
11 borderline. There were just a few spots where
12 there was high uranium activity or at least
13 above the DOE action levels.

14 But then they surveyed the new
15 Betatron building and found no elevated
16 activity both in smear test, in surface
17 contamination studies, in gamma exposure
18 rates, basically it was clean. So we need to
19 delve into that history and possibly a couple
20 of us might make a site visit out there in the
21 near future to see if we can get more
22 information.

23 And that's approximately where this
24 stands right now. It does not seem to be,
25 it's not clear whether you had two Betatrons

1 operating in two separate facilities in which
2 case it was suggested that workers in one
3 facility might be getting irradiated when the
4 Betatron was on in the other facility.

5 But for the both Betatrons were in the
6 same room, clearly, the room would be cleared
7 when either or both machines were on. So in
8 terms of finding out what the exposure rates
9 might be outside the room to workers outside,
10 we still need to collect more information
11 before we can do any definitive analyses. We
12 can do the analyses on the shapes.

13 The other puzzling thing is that they
14 talk about ingots 18 inches in diameter.
15 There is no way you can penetrate an 18-inch
16 ingot with a 25 meV Betatron. I mean, you
17 would be, your exposures would run for days,
18 and the film would be blurred by scatter. So
19 with the practical limit for radiography
20 according to the Los Alamos report for the 22
21 meV Betatron was three inches.

22 According to some scoping calculations
23 that I did based on the fact that there is a
24 current Betatron facility at the Letterkenny
25 Army Depot in Pennsylvania, and they claim

1 they can do 20 inches of steel. Well, to
2 simply take the absorption, you simply say,
3 well, 25 meV Betatron let's say, the photons,
4 the peak energy of the photon would be like 20
5 meV. They'd be a little less than 20 meVs is
6 the right number.

7 And taking the absorption coefficient
8 and the density of uranium and steel, the same
9 photons would penetrate four inches of
10 uranium. This seems to be about a practical
11 upper limit. So I'm not sure how they do and
12 18-inch ingot. We'll have to look into that
13 further. You can do the edges of the ingot by
14 rotating it or if you can get different
15 angles, but you still won't get the core.

16 Then in terms of addressing the
17 different alloys of steel the simplest way to
18 do that, we would simply look at the
19 composition of the alloys, and there's
20 hundreds of steel alloys, which just simply
21 using different concentrations of the various
22 metals that go into it, so the simplest thing
23 to do would be to first just do pure metal.

24 We can do pure iron, pure nickel, pure
25 cobalt, pure manganese, whatever else goes in

1 there, and see which of these give you a
2 serious problem, which of these leads to
3 activation products. According to the NISOH
4 report the only activation product they found
5 was Iron-53 I believe it was.

6 So we'll investigate that and see,
7 confirm that and see whether, in fact, there
8 are any others. And if there are, we might
9 run two or three representative alloys, but we
10 don't have to run every single mixture.

11 **MS. MUNN:** That's certainly an interesting
12 academic exercise no matter how you look at
13 it. If it were occurring a couple of decades
14 later, I would suspect that we might have a
15 problem with units and metric as opposed to,
16 perhaps not.

17 **DR. ANIGSTEIN (by Telephone):** I'm sorry.
18 I'm not following that.

19 **MS. MUNN:** Oh, I'm sorry. I was just
20 thinking about 25-inch diameter ingots and
21 wondering if it might be 25 centimeters, but
22 I'm being facetious when I shouldn't be,
23 sorry.

24 **DR. MAURO:** I wanted to add a new twist and
25 get some guidance from the working group. I

1 got a phone call from John Ramspott the other
2 day. He said he had some additional
3 information. I said, okay, whenever you have
4 any additional information please send it to
5 Larry Elliott and to us at the same time so
6 that I'm assuming you've received the sequence
7 of e-mails that I received related to
8 basically the full range of different kinds of
9 materials.

10 He sent some photographs of the, in
11 any event, information is flowing in. And I
12 guess I'm assuming that we'll take a look at
13 it and use our judgment on what other kinds of
14 analysis might be in order in order to address
15 an issue that might be raised. So what I'm
16 concerned about, I'll give you a very good
17 example.

18 One of the, I found out is when you
19 take a shot, a picture, maybe take multiple
20 shots. They take a big component. They make
21 little squares out of it. And they take a
22 shot, then they move it, take a shot, move it,
23 take a, and then when they're done, they look
24 at the X-ray, and they may see some flaws.
25 And this may be metal not the uranium, and

1 they go repair it.

2 And repairing as I understand it is
3 when they take an acetylene torch and cut it
4 open, and the using a welding fill in the
5 voids or the imperfections so that, that tells
6 me that, okay, so not only is it, and it's
7 done shortly thereafter. The X-ray is taken.
8 They finish.

9 Now we're finding out that when you
10 do, whether it's activation products that's
11 being produced, and they're decaying pretty
12 quickly, but still a person's pretty up close
13 and personal if they're doing some repair
14 work. There's also the question that, well,
15 if you're using an acetylene torch, that means
16 you're generating fumes. So there you have
17 all of a sudden something we didn't even think
18 about. We have an aerosol.

19 Now, the first reaction was, well, if
20 it's an aerosol, we have information on what
21 the concentration is for fumes when you're
22 using an acetylene torch. It turns out
23 there's data on that so we could come up with
24 milligrams per cubic meter, and will know
25 what the activity is in the activated metal,

1 so in theory we could do some internal dose
2 calculations.

3 **MS. MUNN:** And hopefully, you can identify
4 early on whether this will be significant or
5 not. If it's not significant, then it's not
6 worth pursuing. If it's significant, then we
7 need to know that.

8 **DR. ANIGSTEIN (by Telephone):** But
9 basically, it will depend on is the half life
10 of these isotopes because if they go away in a
11 few minutes or even a few hours, even though
12 they could give an external dose, they're
13 powerful gamma emitters, they just won't be in
14 the body long enough to give any significant
15 internal dose.

16 **MS. MUNN:** True.

17 **DR. MAURO:** But I want to give you a sense
18 of the scope. So in other words, the scope is
19 expanding, and we want to make sure that
20 everybody's comfortable with that. Starting
21 from just taking a look at a uranium, in other
22 words, that's how it all began. Someone
23 sending a uranium slab for nondestructive
24 testing using the Betatron, now we're dealing
25 with other metals, other alloys, and also now

1 we're about the repair work that goes with
2 that, so things are expanding.

3 And right now our plan is to look at
4 all of these issues and report back on
5 September 4th on where we are. I still expect
6 to be able to deliver our report in a timely
7 fashion. I think we said about we needed
8 about, I forget how long, how much time,
9 something like six weeks. I forget the time
10 period we gave for getting this work done.

11 **MS. MUNN:** You said about six weeks.

12 **DR. MAURO:** Six weeks to two months, right.
13 I think, so we're still, notwithstanding the
14 change in the somewhat expansion in scope, I
15 think we'd still be able to stick with that
16 timetable and deliver our report.

17 **MS. MUNN:** The potential expansion in scope
18 has been my concern which is why I did not
19 notify other members of the working group and
20 simply asked the question is there any problem
21 with this. I wanted it to occur at this
22 meeting because clearly scope is important.
23 We don't want to miss something that is
24 significant for our dose reconstructors, but
25 at the same time we cannot go on indefinitely

1 looking at every alloy that may have ever
2 passed through General Steel.

3 **DR. ANIGSTEIN (by Telephone):** We wouldn't
4 do that because as I said, we'll just use the
5 individual metals and see which ones, because
6 there's a very large number of alloys but a
7 very small number of metals actually used in
8 the alloys. So the alloy just behaves as the
9 sum of its components. So if we look at the
10 individual components, we'll have covered
11 everything.

12 **DR. WADE:** And let's talk about the two
13 issues. In terms of the expansion of scope at
14 a minimum you need to contact me and let me
15 know. I would suggest that you contact the
16 Chair of the work group, and if she deems it
17 appropriate, the entire work group, because
18 the Board has given the auspices of this work
19 to the work group. But I don't see issues in
20 this, but I think before you would undertake a
21 significant expansion of scope, you should
22 contact me, contact Wanda, and then we can
23 decide on a path forward.

24 **DR. MAURO:** Right now Bob is really --

25 **DR. ANIGSTEIN (by Telephone):** Okay, also --

1 can I make a point, John?

2 **DR. MAURO:** Yeah, sure.

3 **DR. ANIGSTEIN (by Telephone):** In terms of
4 the internal there's really very little work
5 involved because once we've identified which,
6 what are the activation products, which short-
7 lived radioisotopes or perhaps not so short
8 lived, get created, as John said, we have the
9 information on fume concentrations inside the
10 welders mask. Actually we used that in the
11 report that was prepared and published by the
12 NRC so we have sort of a pedigree on that.

13 And then it's just a matter of looking
14 up the dose conversion factors for coming up
15 with the dose. So that's really, we're
16 talking about for any individual isotope,
17 we're talking about a few minutes, an hour's
18 work if that much.

19 **DR. WADE:** And that's fine. I think, John,
20 you need to contact me.

21 **DR. ANIGSTEIN (by Telephone):** We're not
22 talking about a large man-hour effort.

23 **DR. WADE:** The other issue I'd like to talk
24 about before we lose the currency of this is
25 that the situation was that the Board got a

1 letter from Senator Obama asking for an SC&A
2 review of TBD-6000 and the appropriate
3 appendix. The Board accepted that, assigned
4 that work to its contractor. The Board also
5 asked that I schedule an update from the
6 contractor on the September 4th call.

7 I notified John of the fact that that
8 had happened, and he's prepared to do it.
9 Again, this is all done under the auspices of
10 this work group. So whether or not that
11 update happens really depends upon the
12 pleasure of the work group. So I need to know
13 if you're comfortable with John giving the
14 update as the Board had originally asked based
15 on what you've heard today.

16 **MS. MUNN:** It's still my understanding that
17 this is being performed under this year's
18 contract.

19 **DR. MAURO:** Yeah, we will be able to perform
20 this work under the current budget that we've
21 allocated to Task Order Three because it turns
22 out we're coming in under budget on Task Order
23 Three, and we have some extra resources there,
24 so we're able to do that work under Task Order
25 Three and within that six weeks, two months

1 time period including the expanded scope that
2 we just were talking about.

3 **MS. MUNN:** This doesn't sound like a problem
4 to me. Do either of you see a problem? Mark,
5 are you still there?

6 (no response)

7 **MS. MUNN:** Mark doesn't seem to be there.

8 **DR. ANIGSTEIN (by Telephone):** Can I ask a
9 question regarding this? We may not be
10 finished though by September 30th so there may
11 be some expenditures of effort past the
12 current fiscal year.

13 **DR. WADE:** That's fine, not a problem.

14 So the work group now is okay with the
15 work group with SC&A giving this update next
16 Tuesday, and that's fine. That's all we
17 needed to know.

18 **MS. MUNN:** Yes.

19 **DR. ZIEMER:** A couple questions, Bob, can
20 you say anything at this point about the
21 photofission process? My impression is that's
22 a pretty inefficient process, but I don't know
23 much about it beyond that.

24 **DR. ANIGSTEIN (by Telephone):** For uranium
25 you have something a giant quadruple cross-

1 section resonance that's between, just off the
2 top of my head remembering, something like 14
3 meV. And since we have copious photons in
4 that energy range coming out of the 25 meV or
5 24 meV Betatron, you do get significant
6 photofission, much more so than
7 photoactivation of neutron emissions.

8 **DR. ZIEMER:** Well, these are relative terms.
9 The photoactivation is pretty inefficient
10 also, and I think you can look at the medical
11 literature. They used Betatrons in this
12 energy range, and they used alloys for shields
13 to shape the fields, and they get activation
14 of those materials. And so there's a
15 literature on that, but it's very inefficient.

16 **DR. ANIGSTEIN (by Telephone):** Well, the
17 point of the MCNP X analysis is --

18 **DR. ZIEMER:** I know you want to find that
19 out. I was just trying to get a feel how does
20 photofission order of magnitude compare with a
21 neutron-generated fission? Is it like six
22 orders of magnitude less?

23 **DR. ANIGSTEIN (by Telephone):** I can't
24 answer that.

25 **DR. ZIEMER:** Oh, okay. Well, we'll find out

1 I guess.

2 DR. ANIGSTEIN (by Telephone): I mean,
3 certainly, you're not going to get a
4 criticality.

5 DR. ZIEMER: Oh, no, no, no, I'm not even,
6 no, I'm just --

7 DR. ANIGSTEIN (by Telephone): Neutrons you
8 can get criticality.

9 DR. ZIEMER: No, no, I'm talking about the
10 activation products or the fission products.

11 MR. CHEW: But what is the relative cross-
12 sections.

13 DR. ZIEMER: That's why I'm sort of asking.

14 DR. ANIGSTEIN (by Telephone): I'm sorry. I
15 didn't hear that last comment.

16 DR. ZIEMER: What are the cross-sections for
17 photofission compared to the --

18 DR. ANIGSTEIN (by Telephone): I have them.
19 I can't quote them. I don't have them at my
20 fingertips. They're in the documentation for
21 the MCNP X 2.6, and I have it in my computer,
22 but I don't like looking things up while I'm
23 on the phone because I get, I can't do two
24 things at once.

25 MS. MUNN: John, do you feel like you have

1 the answer to your question?

2 DR. MAURO: Yes, the answer is, yes, we
3 should continue down the pathway. And if for
4 any reason anything other evolves in terms of
5 new material comes in that changes the scope
6 again, I will certainly let you know
7 immediately.

8 MS. MUNN: Thank you.

9 DR. MAURO: But so far I feel comfortable
10 that we can take care of this given the time
11 and budget that we originally discussed.

12 MS. MUNN: We'll continue on the path that
13 you have established.

14 **REPORT ON STATUS OF SECOND MATRIX, RATINGS**
15 **AND OF "CROSSWALK" TIB/PROC TABLE**

16 And one last item as I mentioned
17 earlier prior to our wrap up and a review of
18 action items has to do with the Table 1
19 summary of first set of procedure reviews.
20 You may recall that from long, long ago.
21 Kathy Behling, are you still there?

22 MS. BEHLING (by Telephone): I'm still here.

23 MS. MUNN: Bless your heart. Thank you.

24 MS. BEHLING (by Telephone): I'll be brief.
25 You should have received two tables from me
somewhere around July 8th of 2007, and what I

1 was trying to do in response to the request
2 from the previous work group on Table 1 is
3 providing you. I went through the matrix, the
4 first matrix for the first set of procedures
5 that we reviewed, and I summarized all the
6 documents that we reviewed, what revision they
7 were and identified the total number of
8 findings and then the total number of
9 outstanding findings.

10 And let me just define outstanding
11 findings. Those are findings that we had
12 agreed upon that the resolution was for NIOSH
13 to either revise their procedure or replace
14 that procedure. I also included on that table
15 what procedures have been revised by NIOSH and
16 whether SC&A has reviewed those procedures.

17 And the bottom line of Table One is
18 that there's still outstanding findings on
19 five procedures that NIOSH has not, at least
20 based on my current knowledge, has not revised
21 so we're still dealing with the procedure we
22 had reviewed initially. And there are three
23 procedures that NIOSH has revised and SC&A has
24 been given the authorization to review.

25 And those three procedures would be

1 OTIB-0008, OTIB-0010 and those have to do with
2 overestimating procedures for film badges and
3 TLD monitoring. They're not used as
4 frequently I don't think anymore because we're
5 dealing more with best estimate procedures.
6 And then lastly, the procedure we have not
7 reviewed is PROC-90 which actually -- and
8 correct me if I'm wrong here -- but it
9 replaces three of the interview-type
10 procedures. I believe it replaces the
11 scheduling telephone interviews, the
12 performing of the telephone interviews and
13 also receiving telephone interviews.

14 So those are the three procedures that
15 NIOSH has issued revisions to that we have not
16 looked at yet.

17 **MS. MUNN:** And so PROC-90 supposedly
18 replaces four, five and 17, right?

19 **MS. BEHLING (by Telephone):** Four, five and
20 17.

21 Okay, and then Table 2 --

22 **MS. MUNN:** Well, before you go on though,
23 Kathy, did you not say that there were, what
24 number did you say had not been addressed yet?
25 Before you said there were those three, you

1 said there were five that NIOSH had not yet
2 addressed?

3 **MS. BEHLING (by Telephone):** Yes, and, Stu,
4 maybe you can confirm this for me. I have
5 listed that there's still outstanding findings
6 from OCAS IG-002, that's our internal dose
7 limitation guide, and I don't believe there's
8 been a revision to that limitation guide.
9 Also showing OCAS TIB-006, that there's been
10 no revision to that. That's the
11 interpretation of external dosimetry records
12 at the Savannah River site.

13 Also I'm showing no additional
14 revision on OCAS TIB-007, which is neutron
15 exposures at the Savannah River site. OCAS
16 TIB-008, which use of the ICRP-66 to calculate
17 respiratory tract doses. I don't show a
18 revision there. And finally, this is an ORAU
19 OTIB-0001, which is Savannah River claims, no
20 revision on that as far as I know.

21 **MS. MUNN:** Kathy, you got squeaked out by
22 something just on that very last item. Would
23 you repeat that?

24 **MS. BEHLING (by Telephone):** The last
25 procedure that I don't believe there's been a

1 revision to is ORAU OTIB-0001, and the title
2 is Maximum Internal Dose Estimates for
3 Savannah River Site Claims. And that's the
4 high five.

5 **MR. HINNEFELD:** I believe that's accurate,
6 the accurate.

7 **DR. WADE:** Kathy, might I ask you to repeat
8 again the three that have not yet been
9 assigned?

10 **MS. BEHLING (by Telephone):** The three that
11 have not been assigned are ORAUT OTIB-0008,
12 and I'll give you the title. It's the
13 Standard Complex-Wide Conversion Correction
14 Factor for Overestimating External Doses
15 Measured with TLDs.

16 The second procedure we have not been
17 asked to look at is ORAUT OTIB-0010, which is
18 the same title except it's film badge
19 dosimetry. It's the Standard Complex-Wide
20 Conversion Correction Factor for
21 Overestimating External Doses Measured with
22 Film Badge Dosimetry.

23 And then finally, is ORAUT-PROC-90
24 which replaces three of the interview
25 procedures.

1 **DR. WADE:** Thank you very much.

2 **MS. MUNN:** I have one last question how you
3 and Stu both with respect to the five that you
4 gave us that you said no revision had come out
5 yet by NIOSH. Are those all, with the
6 exception of PROC-90, obviously. That's sort
7 of taken care of itself. But are the others
8 procedures which in your view were expected to
9 have revisions?

10 **MS. BEHLING (by Telephone):** Well, based on
11 a resolution that was stated during the
12 original review of these documents, I believe
13 that the resolution was that NIOSH would
14 address the findings or the issues in a
15 revision or a replacement document.

16 **MS. MUNN:** All of them do have a number of
17 outstanding issues, outstanding findings I
18 see.

19 So, NIOSH, are any of those in process
20 right now, those five?

21 **MR. HINNEFELD:** Not, we can put them in
22 progress pretty quickly, but, no, there's no
23 real active work going on on them, but we can
24 get started. We can give Tommy like three of
25 them.

1 **DR. NETON:** He's coming back Tuesday.

2 **MS. MUNN:** Our earlier discussions were
3 indicating how nice it would be to close this
4 table and have it complete. If we can
5 possibly do that without putting undue strain
6 on your staff's schedule, it would certainly
7 be helpful.

8 **MR. HINNEFELD:** We're used to putting undue
9 strain on our staff.

10 **DR. NETON:** We wouldn't know how to work
11 otherwise.

12 **MS. MUNN:** You've had a week of vacation.
13 Now you're ready to jump back in.

14 Thank you, Kathy.

15 **MS. BEHLING (by Telephone):** Okay, do you
16 want me to just briefly explain what's in
17 Table 2?

18 **MS. MUNN:** Yes, please.

19 **MS. BEHLING (by Telephone):** What I did in
20 Table 2 is for those procedures where there is
21 a revision, and we have been asked to review
22 the procedure, I've listed all of the
23 outstanding findings and where we are in
24 resolving those outstanding findings. Now as
25 you'll see, the first item on Table 2 talks

1 about the external implementation guide, OCAS
2 IG-001. And that I actually have reviewed in
3 Supplement 3 of our Task Three. And has
4 Supplement 3 been submitted at this point?
5 I'm not sure.

6 **DR. MAURO:** Yes.

7 **MS. BEHLING (by Telephone):** Okay. What
8 you'll see in that along with, if you go down
9 through this table, I've identified where we
10 have re-evaluated this, whether it's in
11 Supplement 1, which you were looking at
12 earlier today, or Supplement 3. And, in fact,
13 if you go to your Supplement 1, Rev.1 that we
14 were working with earlier and go to somewhere
15 around page 105, you'll see that OTIB-0003 has
16 three outstanding findings.

17 That OTIB was replaced with OTIB-0011,
18 and when I looked at OTIB-0011, I included a
19 table in there which becomes Table 1 and in
20 our checklist becomes Table 2. And that Table
21 1 identifies each of these findings and
22 whether or not we feel that they were properly
23 addressed in the replacement document. And I
24 did this as an example and hoping that the
25 Board would agree with that approach. My

1 feeling is that I think to make it as easy as
2 possible for the work group is if we are able
3 to say, and in this particular case all the
4 issues from the previous OTIB-0003 were
5 addressed in OTIB-0011.

6 However, in some of the other
7 procedures that I looked at such as OTIB-0004,
8 I didn't feel that they had properly addressed
9 all of the items. And in some cases you'll
10 see a no, whether it's been resolved and a no
11 or it's partially been resolved. And I would
12 just suggest that for those items that are a
13 no or partially resolved that they get
14 incorporated into the matrix associated with
15 either that, with our current matrix of
16 Supplement 1 or Supplement 3 so they can be
17 taken off of this original matrix. If that
18 makes sense.

19 **MS. MUNN:** I think it makes sense. And the
20 question that I have right off the bat is why
21 we don't have under the Resolved column for
22 OTIB-0003, why we don't say it's been replaced
23 by OTIB-0011 and thereby eliminate that from
24 this --

25 **MS. BEHLING (by Telephone):** Okay, if you go

1 to page five under the Table 2, under revision
2 re-evaluated I did put OTIB-0011, and I
3 identified it there. I should have made maybe
4 a little bit more clear that this replaces the
5 OTIB-0003.

6 The other thing that I did not do, I
7 just ran out of time here, I didn't fill in
8 the Resolved column for all of these which I
9 am in a position to do that now. I just
10 didn't go back to this.

11 **MS. MUNN:** Good. That seems like, now that
12 you go over it again, I see what you've done.
13 And if we had yes in the resolved column, I
14 think that would probably --

15 **MS. BEHLING (by Telephone):** That would
16 clarify it for you, and I realized today when
17 I went back and I picked up this table that I
18 meant to go back to this. I was working in
19 the Supplement 1, and I got that out the door,
20 and I never went back to this table, but I
21 will. I will update this and send it out to
22 everyone.

23 **MS. MUNN:** That would be helpful, and unless
24 some other members of the working group
25 object, her solutions for moving them off this

1 table is certainly okay with me. Is that fine
2 with NIOSH and with work group members?

3 (no audible response)

4 **MS. MUNN:** Kathy, you have nodding heads
5 here.

6 **MS. BEHLING (by Telephone):** Very good.

7 **MS. MUNN:** Your approach seems perfectly
8 viable here.

9 **MS. BEHLING (by Telephone):** Okay, very
10 good, thank you.

11 **MS. MUNN:** All we can do is keep pushing at
12 this until we finally get this table closed
13 out.

14 **DR. WADE:** Keep on keeping on.

15 **MS. MUNN:** Keep on keeping on. Thank you
16 very much.

17 **DR. ANIGSTEIN (by Telephone):** This is Bob
18 Anigstein. I do have an answer about the
19 cross-section

20 **MS. MUNN:** Oh, do you?

21 **DR. ANIGSTEIN (by Telephone):** Yeah, it just
22 took me a few minutes to find it. While Kathy
23 was talking I was looking for it. For U-235
24 at about 14 meV you get a P cross-section of
25 about 330 millibarns, if that means anything

1 to the person asking the question.

2 MR. CHEW: Sure.

3 MS. MUNN: Yeah, it does.

4 DR. MAKHIJANI: Probably non-negligible.

5 MS. MUNN: Non-negligible but pretty hard to
6 get, I wouldn't want to

7 DR. ANIGSTEIN (by Telephone): I can't hear
8 this.

9 DR. WADE: There's nothing substantive being
10 said.

11 MS. MUNN: We're just saying pretty hard to
12 get but not negligible.

13 MR. CHEW: Two thirty-five, isn't the
14 material 238?

15 DR. ANIGSTEIN (by Telephone): Well, it's a
16 mix. It's natural uranium.

17 MR. CHEW: Yeah, natural, I just --

18 DR. ANIGSTEIN (by Telephone): So natural
19 uranium is about --

20 MR. CHEW: I've been looking it up on the
21 site, too. It says an interesting result is
22 the absence of any gamma to and cross-sections
23 for U-238.

24 DR. ANIGSTEIN (by Telephone): The MCNP X
25 code does have those cross-sections. I just

1 have to be looking at a published paper about
2 this, and they just, they only have a few
3 nuclides that they happened to show here.

4 **DR. WADE:** So you guys can take this up.

5 **MS. MUNN:** We appreciate your taking the
6 time and effort to look it up.

7 And thank you, Mel, for your
8 contribution. That's wonderful.

9 **WRAPUP AND REVIEW OF ACTION ITEMS**

10 Unless there are other really pressing
11 items that anyone has right now, I propose
12 that we continue with our wrap up and review
13 of action items. From my perspective we've
14 gone as far as we could go with Supplement 1
15 Table. Not nearly as far as I had hoped we
16 would be able to go.

17 It's my expectation that we will pick
18 that activity up exactly where we left it with
19 hope that by that time, by the time we meet
20 again NIOSH will have had an opportunity to
21 respond to a significantly larger number of
22 those items than are currently responded to.
23 If anyone has any objection to that process,
24 speak now or forever hold your peace. That's
25 the way it's going to be unless you tell me

1 otherwise.

2 (no audible response)

3 **MS. MUNN:** With that being said, I would
4 appreciate it, Lew, if you could wrap us up
5 and read us the action items so that we all
6 understand what is expected of us between now
7 and our next meeting which --

8 **DR. WADE:** I have 14 action items, and I'll
9 refer where I can to the page in Supplement 1
10 if you want to be able to ground yourself in
11 the --

12 So starting on page six relative to
13 finding OTIB-0020-03, there are two findings.
14 The work group will ask the subcommittee to
15 continue to keep the utility of this OTIB in
16 mind as it reviews individual dose
17 reconstructions.

18 Second finding, NIOSH will consider if
19 more specific guidance within this OTIB would
20 add value to the development of site-specific
21 TIBs.

22 Finding three which relates to page
23 13, OTIB-0028 two and three, findings two and
24 three, NIOSH is to provide SC&A with the
25 output files from Keith Eckerman's analysis.

1 Finding four on page 14, OTIB 0019,
2 which if you recall deals with the
3 interpretation of regression data, NIOSH and
4 SC&A will discuss, hopefully resolve and
5 report to the work group on this issue. This
6 is where the statisticians are going to have a
7 stimulating discussion with each other.

8 On findings five and six, this relates
9 to finding OTIB-0033-01 on page 15. NIOSH
10 will review the title and contents of OTIB-
11 0033 and modify as necessary.

12 Finding two relative to this issue,
13 NIOSH will review OTIBs-0018 and 0033 to see
14 if they are being consistently applied and
15 appropriately used and then report that to the
16 work group.

17 Finding number seven relates to OTIB-
18 0004, and that's on pages 15 through 17.
19 NIOSH will complete OTIB-0053 and then the
20 work group will ask SC&A to review OTIB-0053.

21 Finding number two, NIOSH will confirm
22 that the OTIB deals only with uranium metal
23 facilities and excludes chemical processing of
24 uranium.

25 Then we move to some findings that

1 relate to the global issues. On global issue
2 related to the internal dose from fission
3 products, the work group will recommend to the
4 Board that OTIB-0054 be reviewed by SC&A
5 during next fiscal year. And they'll make
6 that recommendation to the Board during the
7 September 4th call.

8 Relative to the global issue on
9 ingestion, NIOSH will report at/or before the
10 January 8th Board meeting on the status of
11 their work towards resolution of that global
12 issue.

13 Concerning the PERs, NIOSH will
14 provide to the work group a list of completed
15 and in progress PERs, and this will take place
16 before the next work group meeting.

17 With regard to this issue of following
18 up findings to closure, NIOSH will move to
19 complete revisions to the following five
20 documents: OCAS IG-002, OCAS TIB-006, OCAS
21 TIB-007, OCAS TIB-008 and ORAUT OTIB-0001.

22 Next to last action item, SC&A will
23 update its Table 2 to show a more definitively
24 the status of the completed items

25 And then lastly the work group will

1 continue to work on the issues in Supplement 1
2 when next it meets.

3 And I think that's all the findings
4 that I've captured.

5 **MS. MUNN:** Those agree with mine although
6 mine are considerably less articulate than
7 that. It would be --

8 **DR. WADE:** They pay me the big bucks for
9 something.

10 **MS. MUNN:** I know, and thank goodness.

11 It would be helpful for me if you
12 would send me your list electronically so that
13 I can compare it with mine. And there were
14 one or two items that I had worded slightly
15 differently. I'll communicate with you on
16 those.

17 Is anyone else aware of action items
18 that were not covered?

19 (no audible response)

20 **MS. MUNN:** Are we all aware of our next
21 meetings, when we're going to be where we're
22 going to be?

23 **DR. WADE:** It couldn't hurt to remind folks.
24 I think the plan is that on October the 2nd,
25 which is the Tuesday of the week that contains

1 the next face-to-face Board meeting, this work
2 group will meet at a time to be, I think 10:00
3 a.m. we're looking at.

4 **MS. MUNN:** Yes.

5 **DR. WADE:** Ten a.m. central daylight time.

6 **MS. MUNN:** Ten a.m. central, yeah. And we
7 will, unless we have unusual expectations
8 during the month of September, this work group
9 will not have any formal calls or meetings.
10 It's my expectation that we probably will have
11 some kind of formal meeting between the
12 October meeting and the January meeting since
13 we have a considerable body of materials here.
14 And it's clear that we can't handle it in a
15 single day's session.

16 So we'll probably try to complete the
17 material that we did not cover sometime after
18 the October meeting. Hopefully, before we get
19 too far into December, more than likely after
20 Thanksgiving but before Christmas at a time to
21 be announced.

22 Is there anything else for the good of
23 the order?

24 **DR. WADE:** I think this probably ranks in
25 the top five most productive work group

1 meetings. I think everyone did a fine job in
2 terms of preparation and execution, and you're
3 to be complimented.

4 **MS. MUNN:** Thank you all. We will see you
5 in Chicago, Naperville to be precise.

6 (Whereupon, the work group meeting was
7 adjourned at 4:45 p.m.)
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CERTIFICATE OF COURT REPORTER**STATE OF GEORGIA****COUNTY OF FULTON**

I, Steven Ray Green, Certified Merit Court Reporter, do hereby certify that I reported the above and foregoing on the day of Aug. 29, 2007; and it is a true and accurate transcript of the testimony captioned herein.

I further certify that I am neither kin nor counsel to any of the parties herein, nor have any interest in the cause named herein.

WITNESS my hand and official seal this the 14th day of Oct., 2007.

STEVEN RAY GREEN, CCR**CERTIFIED MERIT COURT REPORTER****CERTIFICATE NUMBER: A-2102**